Pushing Performance

HARTING Han-Power®
Power Networks and Industrial Cabling

People | Power | Partnership

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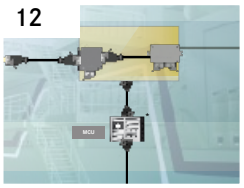
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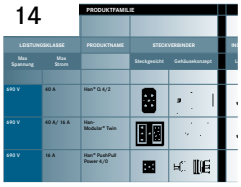
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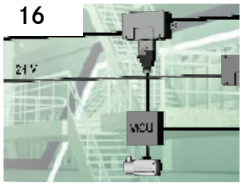
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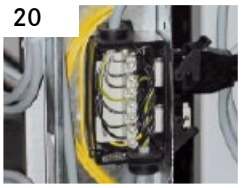
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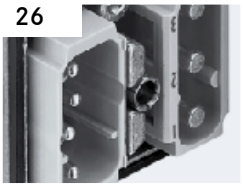
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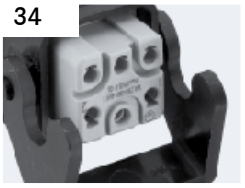
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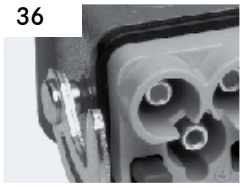
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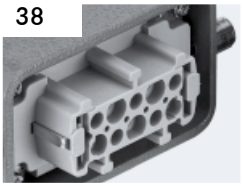
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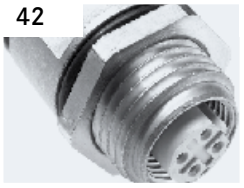
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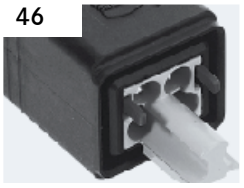
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Transforming customer wishes into concrete solutions

The **HARTING** Technology Group is skilled in the fields of electrical, electronic and optical connection, transmission and networking, as well as in manufacturing, mechatronics and software creation. The Group uses these skills to develop customized solutions and products such as connectors for energy and data transmission applications including, for example, mechanical engineering, rail technology, wind energy plants, factory automation and the telecommunications sector. In addition, **HARTING** also produces electro-magnetic components for the automobile industry and offers solutions in the field of Enclosures and Shop Systems.
The **HARTING** Group currently comprises 32 subsidiary companies and worldwide distributors employing a total of more than 3,000 staff.

HARTING Subsidiary company

HARTING Representatives

We aspire to top performance.

Connectors ensure functionality. As core elements of electrical and optical wiring, connection and infrastructure technologies, they are essential in enabling the modular construction of devices, machines and systems across a very wide range of industrial applications. Their reliability is a crucial factor guaranteeing smooth functioning in the manufacturing area, in telecommunications, applications in medical technology – in fact, connectors are at work in virtually every conceivable application area. Thanks to the consistent further development of our technologies, customers enjoy investment security and benefit from durable, long term functionality.

Always at hand, wherever our customers may be.

Increasing industrialization is creating growing markets characterized by widely diverging demands and requirements. The search for perfection, increasingly efficient processes and reliable technologies is a common factor in all sectors across the globe.

HARTING is providing these technologies – in Europe, America and Asia. The **HARTING** professionals at our international subsidiaries engage in close, partnership based interaction with our customers, right from the very early product development phases, in order to realize customer demands and requirements in the best possible manner.

Our people on location form the interface to the centrally coordinated development and production departments. In this way, our customers can rely on consistently high, superior product quality – worldwide.

Our claim: pushing performance.

HARTING provides more than optimally attuned components. In order to serve our customers with the best possible solutions, **HARTING** is able to contribute a great deal more and play a closely integrative role in the value creation process.

From ready assembled cables through to control racks or ready-to-go control desks: Our aim is to generate the maximum benefits for our customers – without compromise!

Quality creates reliability – and warrants trust.

The **HARTING** brand stands for superior quality and reliability – worldwide. The standards we set are the result of consistent, stringent quality management that is subject to regular certifications and audits.

EN ISO 9001, the EU Eco-Audit and ISO 14001:2004 are key elements here. We take a proactive stance to new requirements, which is why **HARTING** ranks among the first companies worldwide to have obtained the new IRIS quality certificate for rail vehicles.

HARTING technology creates added value for customers.

Technologies by **HARTING** are at work worldwide. **HARTING**'s presence stands for smoothly functioning systems, powered by intelligent connectors, smart infrastructure solutions and mature network systems. In the course of many years of close, trust-based cooperation with its customers, the **HARTING** Technology Group has advanced to one of the worldwide leading specialists for connector technology. Extending beyond the basic functionalities demanded, we offer individual customers specific and innovative solutions. These tailored solutions deliver sustained effects, provide investment security and enable customers to achieve strong added value.

Opting for HARTING opens up an innovative, complex world of concepts and ideas.

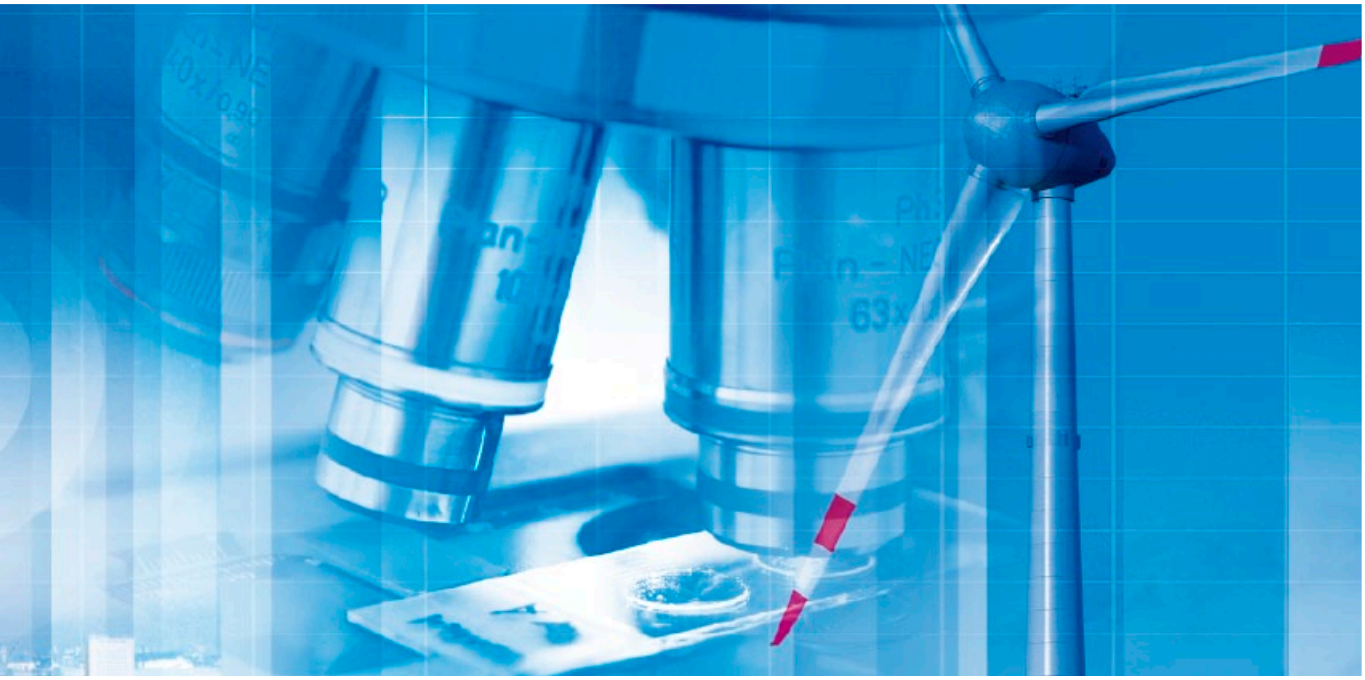
In order to develop connectivity and network solutions serving an exceptionally wide range of connector applications and task scopes in a professional and cost optimized manner, **HARTING** not only commands the full array of conventional tools and basic technologies. Over and beyond these capabilities, **HARTING** is constantly harnessing and refining its broad base of knowledge and experience to create new solutions that ensure continuity at the same time. In securing this know-how lead, **HARTING** draws on a wealth of sources from both in-house research and the world of applications alike.

Salient examples of these sources of innovative knowledge include microstructure technologies, 3D design and construction technology, as well as high temperature or ultra-high frequency applications that are finding use in telecommunications or automation networks, in the automotive industry, or in industrial sensor and actuator applications, RFID and wireless technologies, in addition to packaging and housing made of plastics, aluminum or stainless steel.

HARTING solutions extend across technology boundaries.

Drawing on the comprehensive resources of the group's technology pool, **HARTING** devises practical solutions for its customers. Whether this involves industrial networks for manufacturing automation, or hybrid interface solutions for wireless telecommunication infrastructures, 3D circuit carriers with microstructures, or cable assemblies for high-temperature applications in the automotive industry - **HARTING** technologies offer far more than components, and represent mature, comprehensive solutions attuned to individual customer requirements and wishes. The range covers ready-to-use cable configurations, completely assembled backplanes and board system carriers, as well as fully wired and tested control panels.

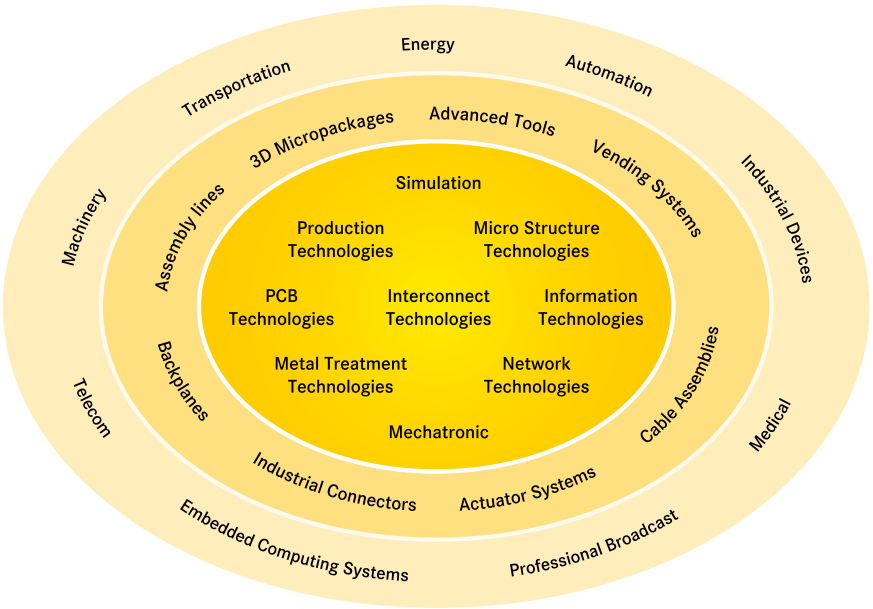
In order to ensure the future proof design of RF- and EMC-compatible interface solutions, the central **HARTING** laboratory (certified to EN 45001) provides simulation tools, as well as experimental, testing and diagnostics facilities all the way through to scanning electron microscopes. In the selection of materials and processes, lifecycle and environmental aspects play a key role, in addition to product and process capability considerations.



HARTING knowledge is practical know-how generating synergy effects.

HARTING commands decades of experience with regard to the applications conditions of connectors in telecommunications, computer and network technologies and medical technologies, as well as industrial automation technologies, such as the mechanical engineering and plant engineering areas, in addition to the power generation industry or the transportation sector. **HARTING** is highly conversant with the specific application areas in all of these technology fields.

The key focus is on applications in every solution approach. In this context, uncompromising, superior quality is our hallmark. Every new solution found will invariably flow back into the **HARTING** technology pool, thereby enriching our resources. And every new solution we go on to create will draw on this wealth of resources in order to optimize each and every individual solution. In this way, **HARTING** is synergy in action.



HARTING network components and cabling

HARTING offers network components and cables for all industrial automation application areas:

In addition to communications, the 400 V power supply and the 24 V voltage supply for automation devices form the major lifelines of every industrial automation system. For **HARTING**, these three lifelines represent a functional unit in which the continuity of the installation concept has to be guaranteed in order to adequately reflect the application requirements.

In communication, **HARTING** supports line, star and ring topologies for the creation of complex networks. The application standards of PROFINET networks are taken into account, as are the requirements for high data rates, e.g. 1 Gbit.

With a look to the power sector, consistency and continuity in the installation concept means that 400 V, 250 V and 24 V are viewed as a whole. Today, systems such as ECOFAST, Desina and PROFINET rank as the application standards, and they are already implemented with the use of **HARTING** network components.

Topological consistency and continuity becomes clear with flexible concepts for setting up suitable infrastructures. This can be achieved with direct point-to-point device connectivity. In “daisy chain” systems, the looping of the power supply line involves running the supply line through the terminal device and then on to the next participant. Backbone structures, however, offer maximum flexibility. In this case, the T-branch is located outside the terminal device and is realized with the relevant **HARTING** power connections.

Field of application – plants and systems

The **HARTING** product range allows the efficient structuring and realization of the infrastructure of the three life-lines and thereby offers customers a wealth of benefits.

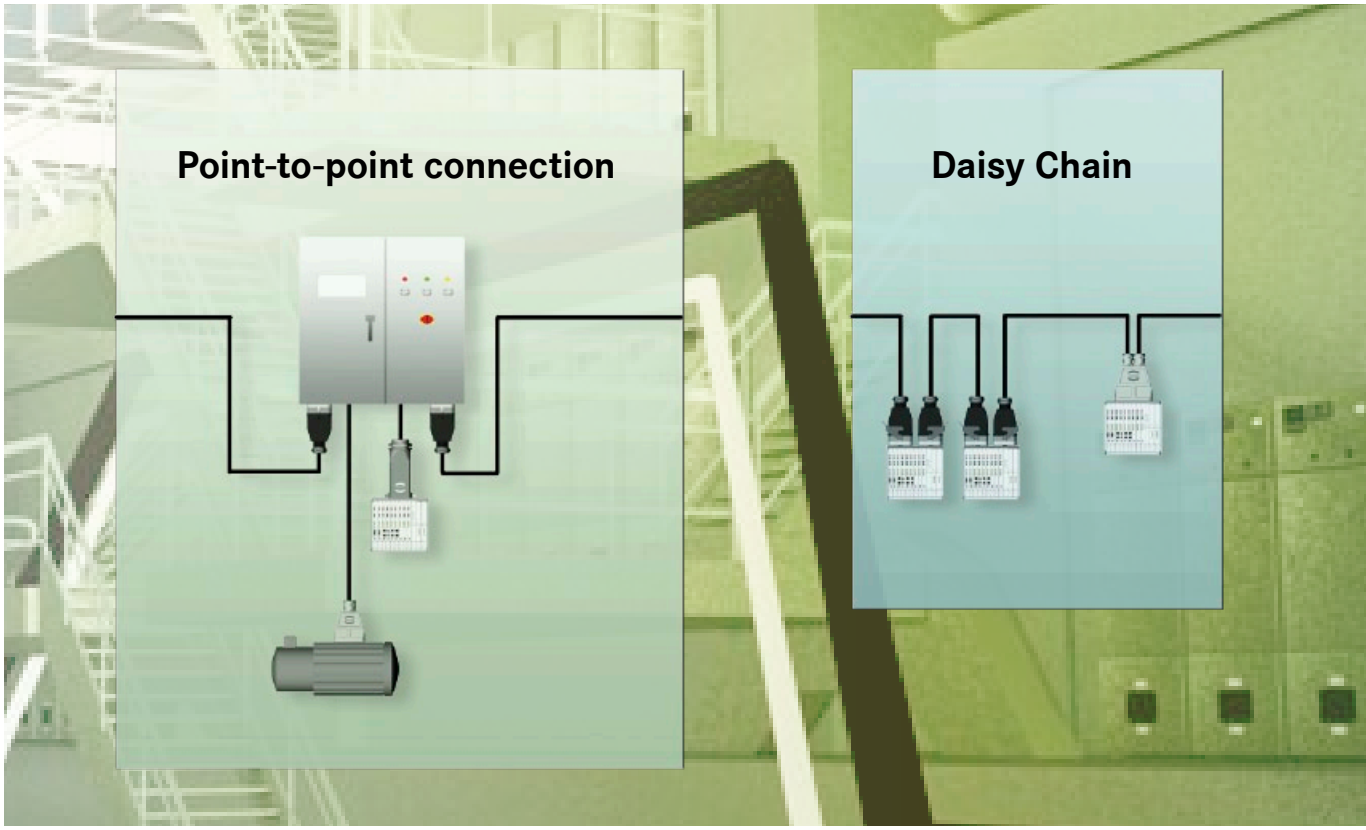
Optimized planning:
The range of technical features, with electrical strengths of up to 690 V, current carrying capacities of up to 40 A and a wire cross-section of up to 10 mm^2, gives engineers the necessary creative freedom when selecting and realizing centralized and decentralized topologies to match the drive concepts of different manufacturers.

Increased productivity:
The focus is on simple installation and assembly, as well as on the serviceability of the various product ranges. With PushPull connectors for power distribution, the small dimensions of a Han-Power® S and optional pluggable tap-off points, significant productivity increases are realized in assembling and commissioning the infrastructure.

Field of application – machines and equipment

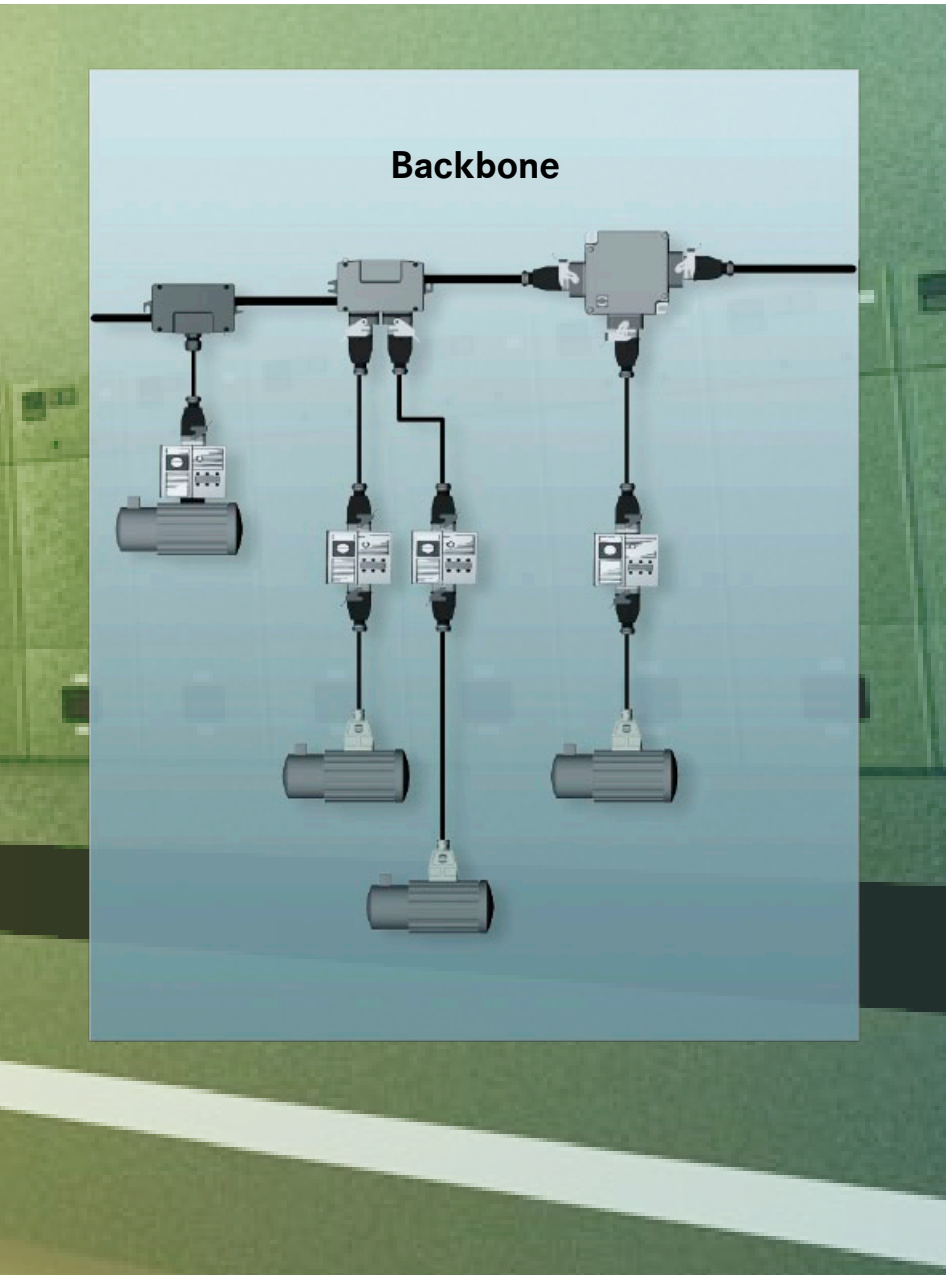
Installation structures for power networks

As a rule, there are three different methods for supplying devices with power and a 24 volt supply.



Point-to-point connection:
Devices can be connected directly to the power supply via a point-to-point connection. If the frequency converter is located in the switch cabinet and a motor is to be connected directly, a simple cable to the device connection is used. This form of supply meets conventional installation practice and will continue to be used in applications that require a classical and thus central switch cabinet set-up.

Daisy Chain:
Devices arranged in a line that have to be powered uniformly can be supplied via the daisy chain concept. In this case, the supply line is fed through the terminal device. Therefore, the terminal device has to be designed in accordance with the output of the entire line. As it is optimally adapted to the line topology, this concept offers limited topological freedom. In view of the fact that the terminal device is used as passive network component for further looping, the power network and terminal devices cannot be separated.



Backbone:

A power network is the most suitable concept for distributed devices in the field that are to be connected to a power supply for both power and 24 volts. The use of relevant infrastructure components, such as T-distributors, enables the construction of a universal power backbone. The backbone distributes power to the devices. As in communication networks, power networks offer high topological flexibility. This flexibility is achieved with HARTING network components that enable distribution from the backbone. Consequently, the installation can be adapted to the application requirements.

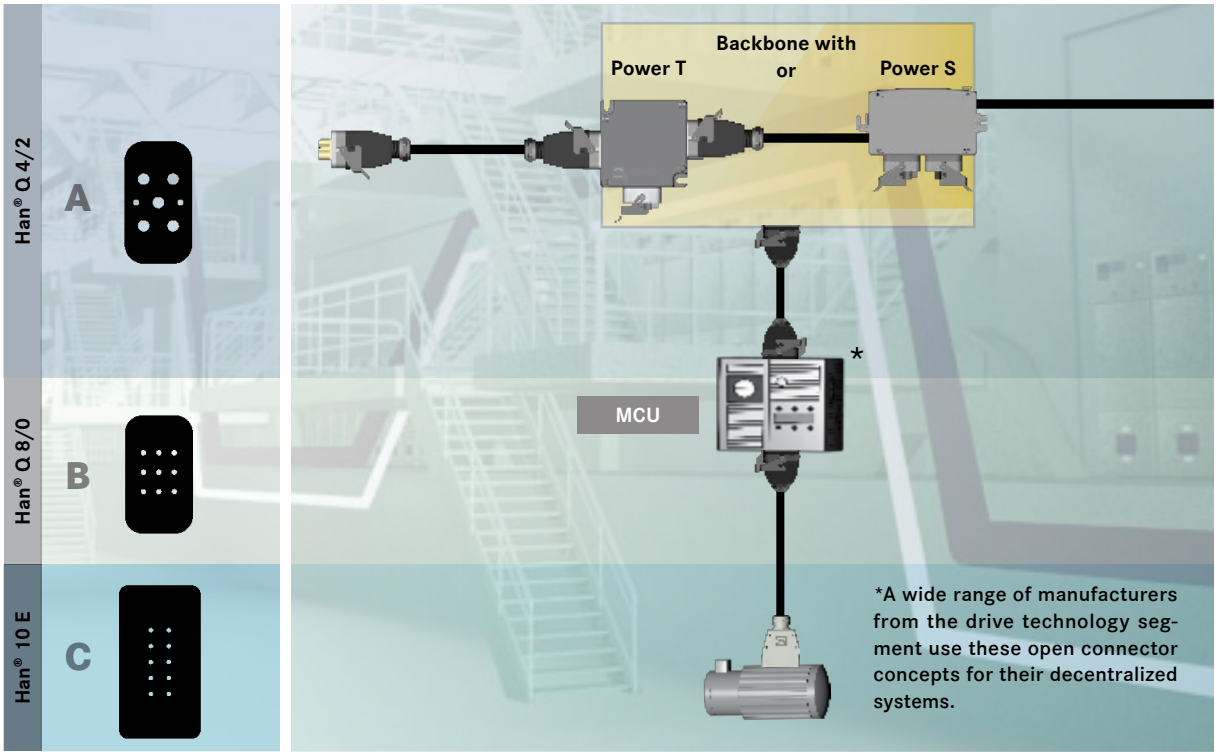
Connector concepts for power networks

The decentralized supply concept for data and power of external consumers in machine tools was originally created under the name of DESINA and the content was later transferred to ISO 23570. The Han® Q 8/0 and Han® Q 4/2 connectors are of key significance in this area. The connector solutions for the drive side are now also grouped under this ISO standard and have already been integrated in numerous applications in the field of materials handling for many years.

A) The Han® Q 4/2 is the connector for distributing power in the field. Whether it is used as a direct connector between units or as the central line from a T-junction, the Han® Q 4/2 provides the optimal mating face for feeding power to decentralized users. The maximum current load of 40 A offers ample possibilities for configuring the network, even with extensive plant structures.

B) The Han® Q 8/0 facilitates power transfers to supply successive motors from the decentralized units (MCUs). If the supply comes through a frequency inverter, the corresponding connector housings with shield connection are available as EMC variants.

C) It has become established practice in recent years to make drives pluggable into plant or machines. A 10 B connector is the size used with drives of up to 7.5 kW. Depending on the power consumption, the Han® 10 E (ES/ESS) is deployed with max. 16 A.



The PROFINET Cabling and Interconnection Technology Guideline issued by PNO forms the basis for standardized connectors and cables for PROFINET. In the guideline, PNO augments its data cabling with the 24 V supply needed to operate things like switches. The HARTING PushPull concept for data and 24 V meets PROFINET requirements.

AIDA, the Automation Initiative of German Automotive Manufacturers, strives to supply all PROFINET devices with a standardized connector. Corresponding power bus systems can then be implemented as a result. This formed the basis for the specification of the Han® PushPull L Power 4/0 for supplying PROFINET devices with 24 V. It gives end users the opportunity to save money as it requires less cabling. The specification also facilitates the selection of devices for the implementation of an automation field in accordance with the PROFINET standard.

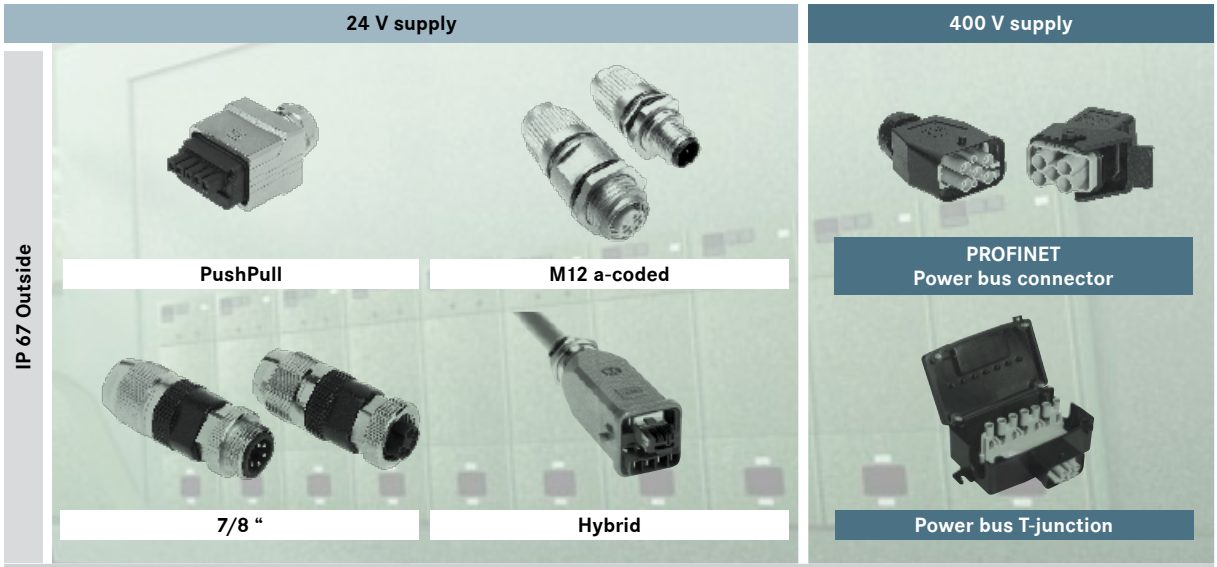
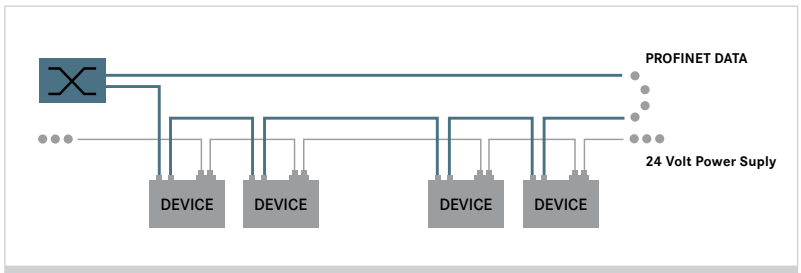


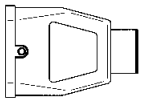
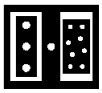
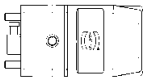
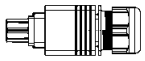
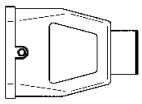
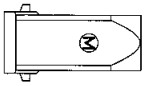
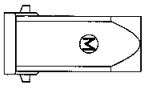
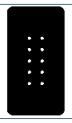
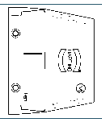
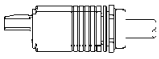
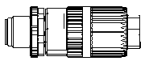
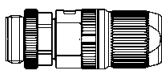
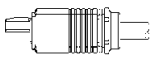
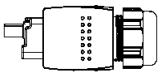
Illustration designed with reference to the PROFINET Cabling and Interconnection Technology Guideline



Automation power cores

The HARTING PushPull concept for data and 24 V offers connection solutions for automation power cores and meets the automotive industry’s PROFINET requirements.

HARTING Selection Guide for power networks

PRODUCT FAMILY					INSTALLATION REQUIREMENTS		
POWER RANGE		PRODUCT NAME	CONNECTOR		INSTALLATION CONCEPT		APPLICATION STANDARD
Max voltage	Max current		Mating face	Housing concept	Line	Point-to-point	
690 V	40 A	Han® Q 4/2 Page 22			✔	✔	ISO, AIDA*
690 V	40 A/ 16 A	Han-Modular® Twin Page 26			✔	✔	DeviceNet
690 V	16 A	Han® PushPull Power 4/0 Page 28			–	✔	–
400 V	25 A	Han® Q 8/0 Page 30			✔	✔	ISO
400 V	16 A	Han® Q 5/0 Page 34			✔	✔	–
400 V	40 A	Han® Q 2/0 Page 36			✔	✔	–
400 V	16 A	Han® 10 E Page 38			–	✔	–
250 V	16 A	HARTING PushPull Power 2/0 Page 40			–	✔	–
50 V	4 A	HARAX® M12 Page 42			–	✔	AIDA*
50 V	8 A	HARAX® 7/8″ Page 44			–	✔	AIDA*, DeviceNet
48 V	12 A	HARTING PushPull Power 4/0 Page 46			–	✔	–
24 V	16 A	Han® PushPull L Power 4/0 Page 48			✔	✔	AIDA*

* Automatisierungs- Initiative Deutscher Automobilhersteller
Automation Initiative of German Automotive Manufacturers

INSTALLATION COMPONENTS							
DAISY CHAIN / POINT-TO-POINT	SYSTEM CABLE	BACKBONE					
CONNECTOR		POWER BUS, PLUGGED	POWER BUS, UNCUT				
Hoods/housings & inserts		Connector outlet	Connector outlet		Cable outlet		Feeder module
1 outlet		1 outlet	1 outlet	2 outlets	1 outlet	2 outlets	Feed-in
	on request						
	on request						
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	on request						

The Selection Guide for power networks offers a structured method for defining the optimum network components for each application requirement.

Starting with known basic conditions, such as voltage and current, the potential products can be quickly identified. The suitable product family can then be identified on the basis of further requirements, such as the necessary installation concept. This brochure contains an initial product overview and also refers to the relevant catalogue and chapter.

Example:
A decentralized distribution system for 400 V with 25 A is needed within a PROFINET installation:

- Based on the power range, the Han® Q 4/2 and Han® Q 8/0 are suitable
- Both offer decentralized distribution through a T-distributor
- Both conform to ISO 23570
- The PROFINET application determines which is more appropriate
- The Han® Q 4/2 also conforms to the PROFINET Guideline and can be used in a PROFINET installation

Han-Power® in practice

Topology realization

In order to effectively reduce installation costs, the 24 V and 400 V installation levels must be considered separately and also in combination. The topologies presented here demonstrate various possibilities for separate and combined – and therefore cost-saving – distribution of 400 V and 24 V, and 400 V and 230 V. Given modern-day requirements, the power distribution of 400 V alone is often no longer sufficient for variable, decentralized concepts in machinery and plant engineering.

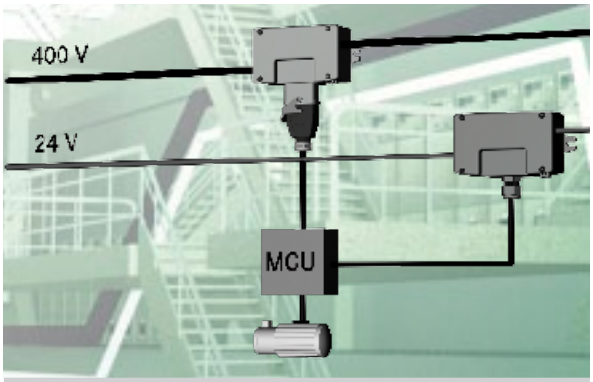


Figure 1: Separate cable installation

Figures 1 and 3 illustrate the separate installation of the line topology for 400 V and 24 V. In line with the requirements, the distribution systems are realized in one or two Han-Power® S. The outlets can be prefabricated as pluggable or with a cable with/without connector in accordance with ISO 23570.

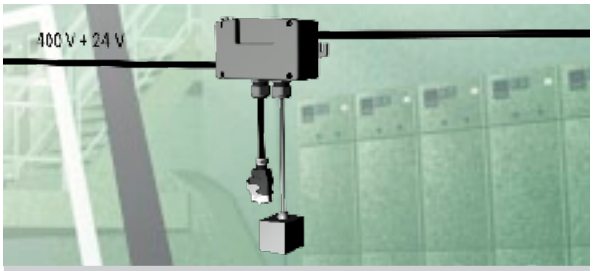


Figure 2: Combined cable routing

It is also possible to route 400 V and 24 V through a single cable given sufficiently protected cabling. The Han-Power® S is equipped with two cable outlets – with optional connectors, e.g. the AIDA-conform Han® PushPull L Power for the 24 V.

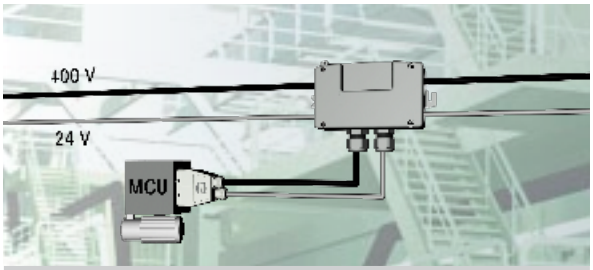


Figure 3: Compact distribution

Figure 3 illustrates a very compact 400 V and 24 V T-distribution system. The separately installed cable outlets can be brought together in one connector at the MCU.

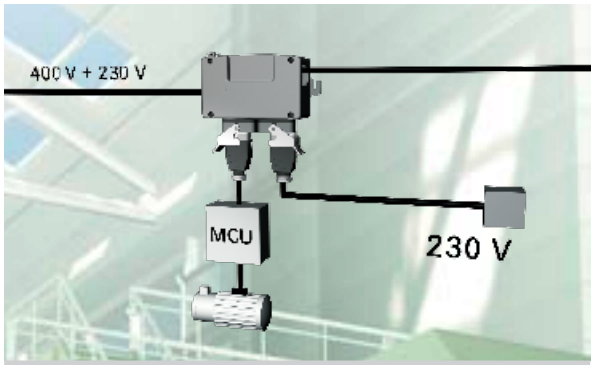


Figure 4: Additional 230 V supply

The additional 230 V to 400 V power supply can keep important decentralized plant functions such as communication, PSUs and I/O modules operational even in the event of an emergency switch-off. The Han-Power® S – with optional cable or connectors – employed here is supplied with two cable outlets.

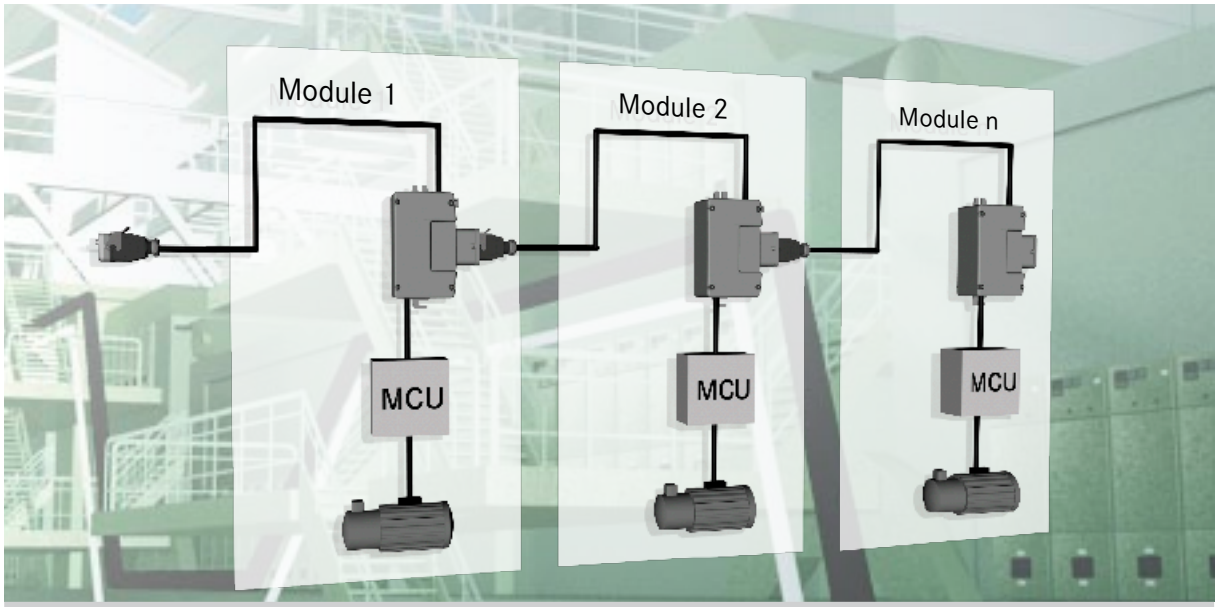
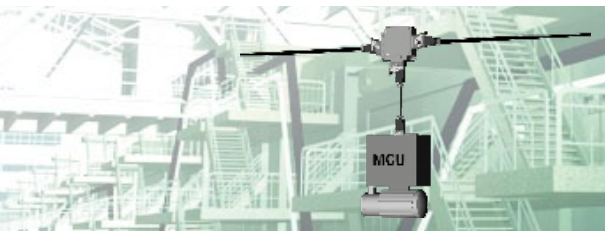


Figure 5: Modular structures/segmentation

Modular structures / segmentation

A modular installation structure in machine and plant engineering offers advantages for the assembly, commissioning and expansion of plant elements. Modular machine segments can be installed separately prewired (incl. testing) and can subsequently be combined very easily with other segments through connectors. Modular, decentralized power distribution can be realized, for instance, with the Han-Power® T or the Han-Power® S with Han® Q 4/2 in accordance with the mapped topology. The modules are simply plugged together. The possibility of connecting a max. 7-pin cable allows for a diverse range of installation variants.



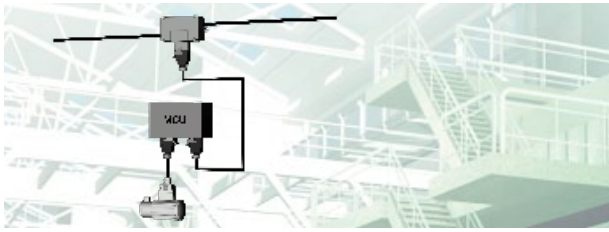
Conveyor technology in automotive engineering: Installation at Daimler AG

Distributed installation technology has been in widespread use in automotive engineering for a number of years now. Applications in the field of conveyor technology for automobiles or in the transport of vendor parts are characterized by extended facilities. Distributed installation structures are particularly advantageous and have now become the technical standard.

In an axle assembly project at the Daimler plant in Untertürkheim/Mettingen, a network with Han-Power® components was opted for to connect the decentralized drives. Power is supplied to various drives in the conveyor lines and the variable positioning necessary for these drives calls for the greatest degree of flexibility as possible.

HARTING solved this problem with the Han-Power® T Q4/2 as power distribution branch to the drive elements. On the one hand, this enables quick assembly as the supply line, the outgoing motor circuit and the extensions are completely pluggable. On the other hand, this type of installation also offers the user maximum flexibility if the system structure is redesigned. Modifications can be carried out quickly and faultlessly without the need for a specialist to make the reconnections.

HARTING Han-Power® components are employed in a wide variety of different projects at Daimler AG and they are a fixed element of the central regulations for operating materials.



SIEMENS Airport Logistics

HARTING has maintained a close business relationship with Siemens ever since the introduction of bus technologies in the field of data and power distribution connectors for the interfaces of distributed drive technology. In recent years, large projects in the field of airport logistics have been carried out at the Dubai, Seoul and Bejing airports.

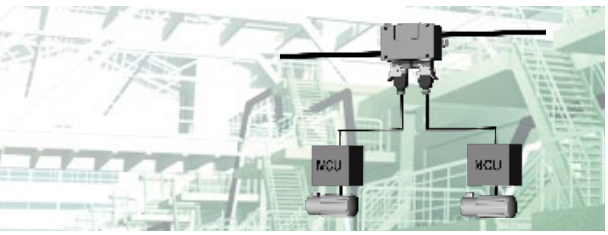
Distributed drives are primarily used for luggage conveyor systems. At Dubai Airport, for example, a total of about 13,000 devices has been installed. As a special requirement, the airport operator stipulated that all devices had to be supplied in versions with plug-in connectors to minimize the time it takes to swap devices.

The **HARTING** Han-Power® S and Han® Q4/2 are utilized in the 400 V power distribution system. The Han® Q 8/0 on the motor starter and the Han® 10 E on the motor provide plug-in connectivity for the drives.

The Han-Compact®, Han-Brid® and Han® EMC series were developed and modified for the special requirements of these applications. **HARTING** and the Siemens business unit responsible for low voltage circuit technology jointly developed the Han-Power® S power bus system, and the components are supplied by **HARTING**.

The intensive and extremely successful partnership between Siemens and **HARTING** has resulted in the Siemens Solution Automation Partnership, which has been in place since June 2007. On this foundation, **HARTING** supplies system cables and connectors for the Simatic ET 200X, ECOFAST, Simatic ET 200pro Sivacon MCU and Sinamics G120D distributed drive systems.

Solution Partner
Automation
SIEMENS



Warehouse logistics at RILA Feinkost

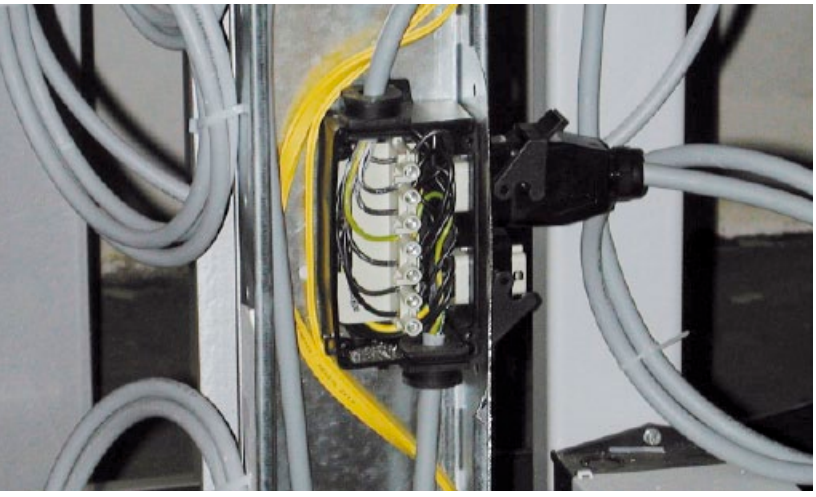
HARTING power network products are at work in the high rack and order picking warehouse of the company RILA Feinkost Import based in Stemwede-Levern, Germany.

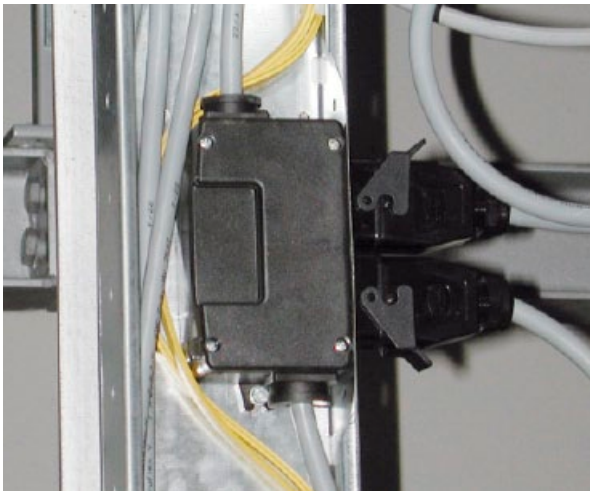
The warehouse logistics at RILA Feinkost require a decentralized system structure where the individual motor starters distributed in the system are supplied with energy by a power-bus system in bus topology. This structure saves cabling and installation time since, compared with alternative solutions on the one hand, far fewer cables have to be laid and, on the other hand, the pluggable tap-off point guarantees a fault-free connection to the motor starter.

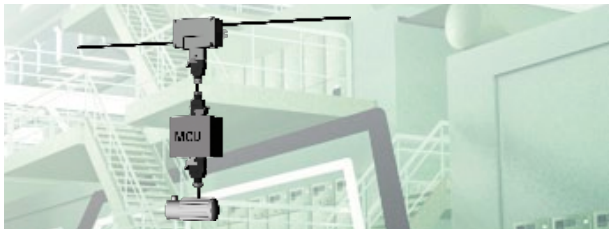
The low construction height of the Han-Power® S products utilized enabled their positioning within the cable duct. This dispensed with the need to provide a complex feed out for the cable conduit.

In rack conveyor systems in particular, two drives are often positioned in very close vicinity. With the dual variant of the Han-Power® S, which features two connection outlets, two adjacent drives can be connected to one branch. This further reduced the connection costs per drive.

Additional advantages arise in the service and maintenance areas. The distributed components can be quickly replaced by disconnecting the plug connectors without opening the casing and without manual rewiring. These time savings translates as increased system availability.







The conveyor belt system at ATS Transporttechnieken BV

ATS Transporttechnieken BV headquartered in Rijen in the Netherlands specializes in the construction of palletizing and pallet transport systems. Its customers include high-profile manufacturers, as well as the food, beverage and building materials industries. The modularity of the systems enables their adaptation to a wide variety of different products.

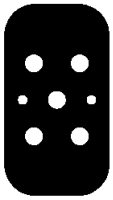
Machine and plant developers require a greater distribution of device functions with standardized interfaces. The objective is to integrate the most cost effective installation technology for power distribution. In this way, conventional installation technology is considerably optimized. Conventional wiring is characterized by the star-shaped installation of the signal and power transfer. In practice, this means that each motor is connected to a power cable from the control cabinet. All sensor and actuator terminals, such as proximity switches or valves, are also wired in parallel.

Modern wiring technology employs serial bus components for connecting sensors and actuators. The use of **HARTING** products also enables this efficient wiring technology in power distribution. Today, intelligent motor control units are relocated so that they are directly positioned at the machine or conveyor belt. Power T-distributor systems that allow a number of “consumers” to be connected on one cabling line, while still complying with all relevant national and international standards, represent an essential element of this decentralized wiring technology.

The use of Han-Power® S supports the modular structure of conveyor belts, which involves individual sections being mounted on site to create a single unit. The mechanical set-up and prefabricated wiring increase availability and enable faster commissioning.

Depending on the system configuration, the one or two-power feeder version of the Han-Power® S with Han® Q 4/2 connector is used on the modular units of the company ATS Transporttechnieken BV. The AS interface was selected for motor control.

Han® Q 4/2



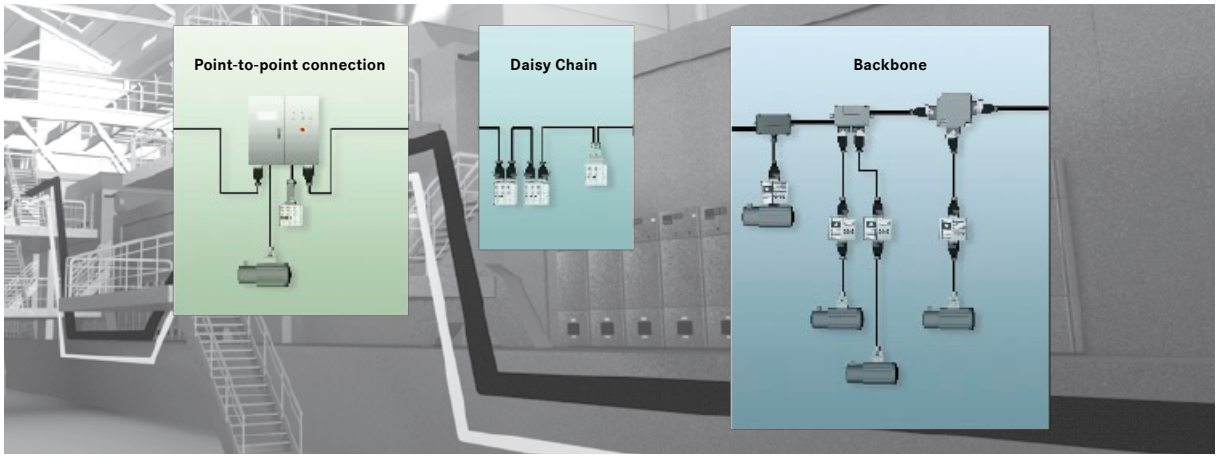
The Han® Q 4/2 product family is primarily designed for ISO 23570-compliant decentralized power distribution in drive applications. Han® Q 4/2 connectors are available with crimp terminals or axial screw termination for field assembly[1]. Pre-terminated system cables in varying lengths can also be supplied.

Technical characteristics

Number of contacts	
- Power contacts	4 + PE
- Signal contacts	2
Electrical data acc. to DIN EN 61 984	
Power side	40 A 400/690 V 6 kV 3
Rated current	40 A
Rated voltage conductor - ground	400 V
Rated voltage conductor - conductor	690 V
Rated impulse voltage	6 kV

Pollution degree	3
Rated voltage acc. to UL/CSA	600 / 250 V
Insulation resistance	≥ 10^{10} kΩ
Material	Polycarbonate
Limiting temperatures	-40 °C ... +125 °C
Flammability acc. to UL 94	V 0
Mechanical working life - Mating cycles	≥ 500
Degree of protection acc. to DIN EN 60 529	IP 65

Installation solutions



Applications

Systems applications

USER BENEFITS:

- line or tree topology in power distribution applications
- high current rating (40 A)
- user-friendly plug-in technology
- fault-free connections
- the available system components support a variety of solutions
- customer-specific versions available on request

Han-Power® T

FEATURES

- Per 1 connection for power input, power output and to device
- Male and female inserts finger protected
- 4 power contacts, 2 signal contacts
- Metal housing

Identification	Part number
Han-Power® T with 3 x Han® Q 4/2 in Han-Compact® housings, bulkhead mounting 4 mm²	09 12 008 4720

Han-Power® S

FEATURES

- 6 IDCs + PE
- Wire gauge 2.5 - 6 mm²
- No interruption of the energy supply
- Leading protective ground within the insert
- Assembly with standard tools

Identification	Part number
Han-Power® S Han® Q 4/2, 1 moulded Han-Compact® hood	
2.5 - 4 mm²	09 12 008 4804
4 - 6 mm²	09 12 008 4806

Han-Power® S

FEATURES

- 6 IDCs + PE
- Wire gauge 2.5 - 6 mm²
- No interruption of the energy supply
- Leading protective ground within the insert
- Assembly with standard tools

Identification	Part number
Han-Power® S Han® Q 4/2, 2 screwed Han-Compact® housings, bulkhead mounting 4 - 6 mm²	09 12 008 4807

Han-Power® S

FEATURES

- high-strength metal version
- 6 IDCs + PE, wire gauge 4 - 6 mm²
- 4 IDCs + PE, wire gauge 10 mm²
- No interruption of the energy supply

Identification		Part number
Han-Power® S Han® Q 4/2, 1 screwed Han-Compact® housing, bulkhead mounting	4 - 6 mm²	09 12 008 4901
	10 mm²	09 12 008 4951

Han-Power® S with cable entry

FEATURES

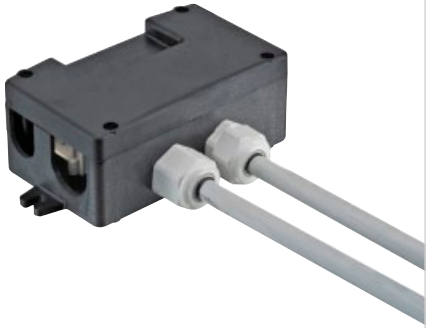
- 6 IDCs + PE
- Wire gauge 2.5 - 4 mm²
- No interruption of the energy supply
- Assembly with standard tools
- customer-specific T connection with defined cable length and connector available on request

Identification	Part number
Han-Power® S with cable clamp with 1 permanently attached cable 3 m, 7 x 2.5 mm²	09 12 008 4803

Han-Power® S with 2 cable entries

FEATURES

- 6 IDCs + PE
- Wire gauge 4 - 6 mm²
- No interruption of the energy supply
- Assembly with standard tools
- customer-specific T connection with defined cable length and connector available on request



Identification	Part number
Han-Power® S with cable clamp with 2 permanently attached cables, 4 x 2.5 mm²	09 12 008 4817

Han® Q 4/2 connector

FEATURES

- 4 Power contacts Han® C and 2 Signal contacts Han® D
- Touch-proof
- Leading protective ground
- 3 coding possibilities by using a coding pin instead of fixing screw

Identification	Part number	
	Male insert (M)	Female insert (F)
Contact insert with Crimp termination Order crimp contacts separately	09 12 006 3041	09 12 006 3141
Axial screw termination[1)] (see photo)	09 12 006 2663	09 12 006 2763
Crimp contacts		
Han® C contacts		
Power contacts silver plated 1.5 mm²	09 32 000 6104	09 32 000 6204
Power contacts silver plated 2.5 mm²	09 32 000 6105	09 32 000 6205
Power contacts silver plated 4 mm²	09 32 000 6107	09 32 000 6207
Power contacts silver plated 6 mm²	09 32 000 6108	09 32 000 6208
Han D® contacts		
Signal contacts 1 mm²	09 15 000 6102	09 15 000 6202
Signal contacts 1.5 mm²	09 15 000 6101	09 15 000 6201
Signal contacts 2.5 mm²	09 15 000 6106	09 15 000 6206

Identification	Part number	Cable entry metric
Hoods, thermoplastic top entry	19 12 008 0429	M25
Hoods, metal side-entry	matt nickel plated 19 12 008 0528	M25
Housings, bulkhead mounting, thermoplastic	09 12 008 0327	
Housings, bulkhead mounting, metal	black chromated 19 12 708 0301	M25
Cable seal, thermoplastic	19 12 000 5157	M25
Cable seal, metal	19 12 000 5057	M25

System cables in fixed lengths

FEATURES

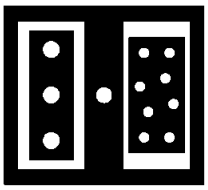
- pre-assembled on both sides
- plastic hood, black
- top entry
- Hoods, cable to cable, with male insert and hoods with female insert
- cable: 5x 4 mm²

Identification		Part number
Cable lengths (total length)	1.5 m	20 88 641 1015
	3 m	20 88 641 1030
	5 m	20 88 641 1050
	10 m	20 88 641 1100
	15 m	20 88 641 1150

For more information, refer to chapter 15 of the HARTING Han® industrial connector catalogue or go to www.HARKIS.HARTING.com

[1)] For more information, refer to Chapter 00 of the HARTING Han® industrial connector catalogue

Han-Modular® Twin



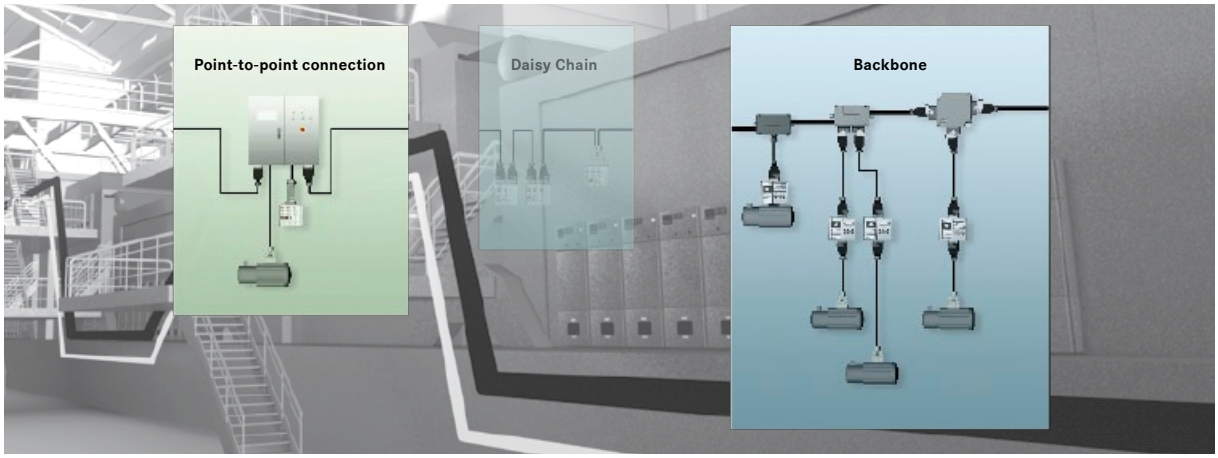
The HARTING Han® Modular Twin product family is designed for power and data distribution applications that span long distances. It combines voltage and power distribution with data communications in a compact, rugged plug-in connector and T connector.

Technical characteristics

Han-Power® T modulear Twin	
Number of contacts	
- Power contacts	3
- Signal contacts	4
Electrical data acc. to DIN EN 61 984	
Power side	40 A 400/690 V 6 kV 3
Rated current	40 A
Rated voltage conductor - ground	400 V
Rated voltage conductor - conductor	690 V
Rated impulse voltage	6 kV
Steuerungsseite	16 A 400 V 6 kV 3
Rated current	16 A
Rated voltage	400 V
Rated impulse voltage	6 kV
Rated voltage acc. to UL/CSA	600 V

Material	zinc die-cast
Limiting temperatures	-40 °C ... +125 °C
Flammability acc. to UL 94	V 0
Mechanical working life	
- Mating cycles	≥ 500
Degree of protection acc. to DIN EN 60 529	IP 65
Hoods/housings	
Material	aluminium die-cast
Surface	powder-coated
Locking element	Han-Easy Lock®
Flammability acc. to UL 94	V 0
Limiting temperatures	-40 °C ... +125 °C
Degree of protection acc. to DIN EN 60 529 for coupled connector	IP 65

Installation solutions



Applications

Systems & machine applications

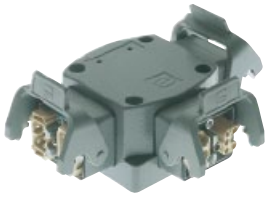
USER BENEFITS:

- 400 V and 24 V power distribution with cable plug in detection
- uses standard Han-Modular® inserts
- supports customer-specific Han-Modular® Twin configuration
- user-friendly 2-piece hood
- supports power distribution solutions up to 6 mm²

Han-Power® T with 3 x Han-Modular® Twin

FEATURES

- Per 1 connection for power input, power output and to device
- Male and female inserts finger protected
- 4 power contacts; 2 signal contacts
- Metal housing



Identification	Part number
Han-Power® T with 3 x Han-Modular® Twin	09 12 008 4760

Han-Modular® Twin

FEATURES

- modulear structure increases flexibility
- Simple and quick assembly
- Robust design
- Two part grommet housing

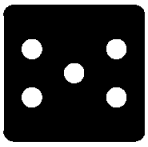
Identification	Part number	
	Male insert (M)	Female insert (F)
Contact insert with		
Number of contacts: 3		
Han® C axial screw module[1)] 40 A 2.5 ... 8 mm²	09 14 003 2601	09 14 003 2701
Han® C module Cable diameter up to 5 mm	09 14 003 3001	09 14 003 3101
Han® C 4 mm²	09 32 000 6107	09 33 000 6207
Crimp 6 mm²	09 32 000 6108	09 33 000 6208
contacts 10 mm²	09 32 000 6109	09 33 000 6209
Number of contacts: 8		
Han® EE module	09 14 008 3001	09 14 008 3101
Han® E 1 mm²	09 33 000 6105	09 33 000 6205
Crimp 1.5 mm²	09 33 000 6104	09 33 000 6204
contacts 2.5 mm²	09 33 000 6102	09 33 000 6202

Identification	Part number	Cable entry metric
Hoods top entry	19 14 002 0402	M32
Carrier hood	09 14 002 0311	
Cable seal (IP 68) metal	19 00 000 5094	M32

For more information, refer to chapter 06 of the HARTING Han® industrial connector catalogue or go to www.HARKIS.HARTING.com

[1)] For more information, refer to Chapter 00 of the HARTING Han® industrial connector catalogue

Han® PushPull Power 4/0



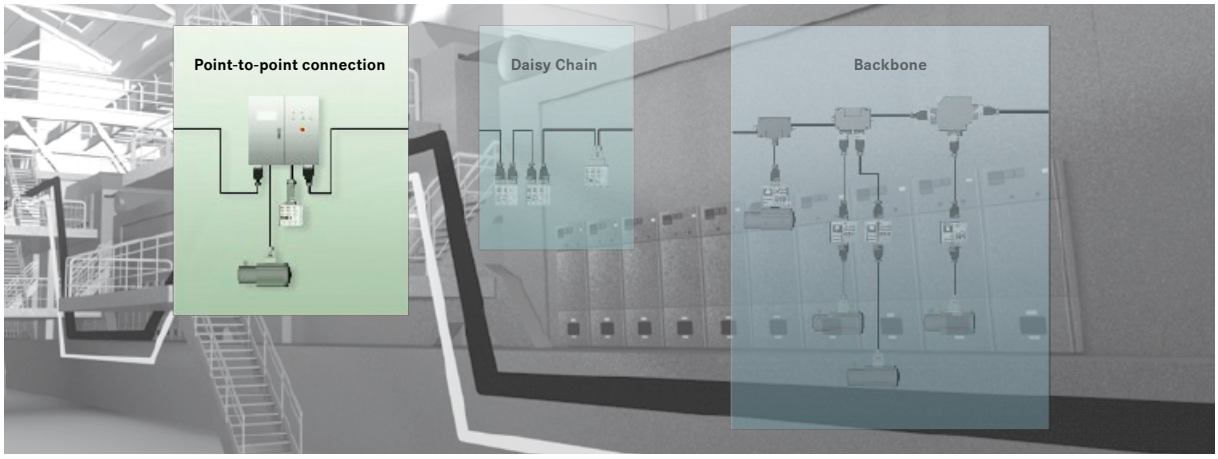
The Han® PushPull Power 4/0 product family is ideal for connecting equipment to a 400 V supply without taking up much space. Devices are connected via PCB connection elements or panel feed-throughs using the Han-Quick Lock®[1)] fast-connect system.

Technical characteristics

Locking	PushPull technology acc. to IEC/PAS 61 076-3-117
Degree of protection	IP 65 / IP 67
Number of contacts	4 + PE
Electrical data acc. to DIN EN 61 984 – with solder termination	16 A 690 V 4 kV 3 16 A 230/400 V 4 kV 3
Termination cross section	0.5 - 2.5 mm²

Mating cycles	min. 500
Temperature range	-40 °C ... +85 °C
Housing material	thermoplastic, black
Flammability acc. to UL 94	V 0
Cable diameter	4 - 13 mm
Housing material	Zinc die-cast, nickel plated

Installation solutions



Applications

Machine applications

USER BENEFITS:

- compact design
- PushPull locking increases packing density
- one-handed operation
- fast-connect QuickLock[1)] technology for field installation
- for AC voltage up to 690 V
- extensive product family

Han® PushPull Power 4/0

FEATURES

- available as plastic or metal housing
- Compact, space-saving design
- Touch-proof
- Cable side: female
  - Crimp termination
  - Han-Quick Lock®[1] termination technology
    Field-assembly without special tools
- Device side: male
  - Panel feed-through with crimp termination
  - Panel feed-through with Han-Quick Lock®[1] termination technology
  - Male insert for PCB termination

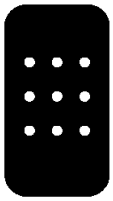
Identification	Part number
Connector, thermoplastic	
including housing and female insert, 16 A, 690 V 9 - 13 mm clamp range	
with crimp termination[2]	09 35 231 0423
with Han-Quick Lock®[1] termination	09 35 232 0423
Connector, metal	
including housing and female insert, 16 A, 690 V 4 - 11 mm clamp range	
with crimp termination[2]	09 35 231 0401
with Han-Quick Lock®[1] termination	09 35 232 0401
Panel feed-through, thermoplastic	
including housing, bulkhead mounting, and male insert, 16 A, 690 V	
for crimp termination[1]	09 35 231 0333
with Han-Quick Lock®[1] termination	09 35 232 0333
Panel feed-through, metal	
including housing, bulkhead mounting, and male insert, 16 A, 690 V	
for crimp termination[2]	09 35 231 0313
with Han-Quick Lock®[1] termination	09 35 232 0313
Components device side	
Housing, bulkhead mounting, thermoplastic (see photo)	09 35 002 0323
Housing, bulkhead mounting, metal	09 35 002 0303
Male insert for PCB termination 16 A, 230/400 V	
angled (see photo)	09 35 002 3003
straight	09 35 002 3004

[2] Order Han P crimp contacts separately

For more information, refer to chapter 02 of the HARTING Device Connectivity catalogue
or go to www.HARKIS.HARTING.com

[1] For more information, refer to Chapter 00 of the HARTING Han® industrial connector catalogue

Han® Q 8/0



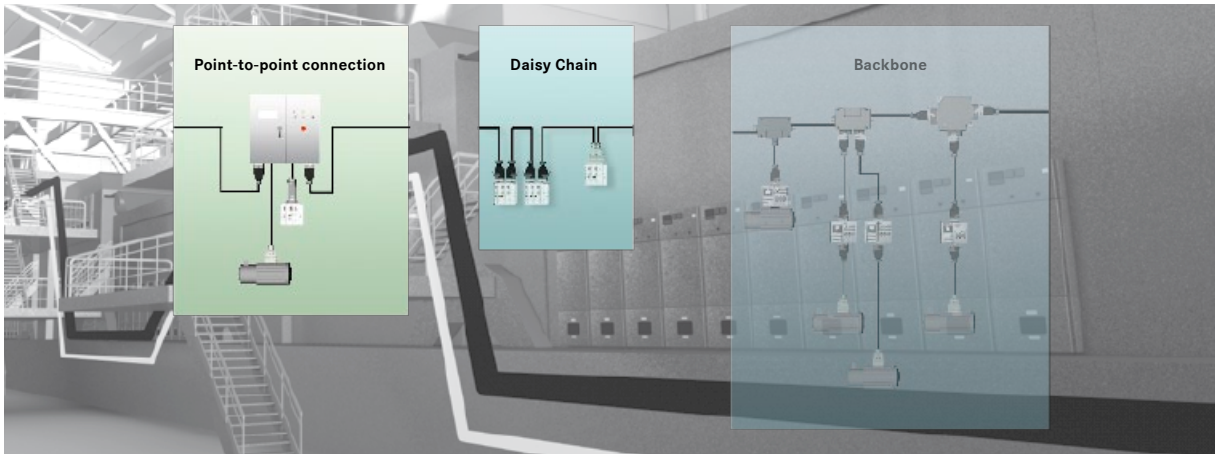
The Han® Q 8/0 product family includes ISO 23570-compliant connectors, which can be used as output connectors linking distributed peripherals to drives, as well as 7-conductor T connectors. The connectors are available with crimp terminals or Han-Quick Lock®[1)] termination for field installation. Pre-terminated system cables in varying lengths can also be supplied.

Technical characteristics

Han-Power® S Q 8/0	
Number of contacts	
- Power contacts	6 + PE
Electrical data	
acc. to DIN EN 61 984	25 A 500 V 6 kV 3
Rated current	25 A
Rated voltage	500 V
Rated impulse voltage	6 kV
Pollution degree	3
Rated voltage acc. to UL/CSA	600 V
Insulation resistance	≥ 10^{10} kΩ
Material	Polycarbonate
Limiting temperatures	-40 °C ... +125 °C
Degree of protection	
acc. to DIN EN 60 529	IP 65

Contacts	
Material	copper alloy
Surface, hard silver plated	3 µm Ag
Contact resistance	≤ 1 mΩ
Crimp termination	
- mm^2	0.14 ... 4 mm^2
- AWG	26 ... 12
Hoods/housings	
Plastic hoods/housings	
Material	Polycarbonate
Limiting temperatures	-40 °C ... +125 °C
Degree of protection acc. to DIN EN 60 529 for coupled connector	IP 65

Installation solutions



Applications

Systems applications

USER BENEFITS:

- line or tree topology in 3-phase 400 V power distribution applications up to 25A
- connector current rating, 8-contact, 16 A
- user-friendly plug-in technology
- fault-free connections
- the available system components support a variety of solutions

Han-Power® S

FEATURES

- 6 IDCs + PE
- Wire gauge 2.5 - 6 mm²
- No interruption of the energy supply
- Leading protective ground within the insert
- Assembly with standard tools

Identification		Part number
Han-Power® S Han® Q 8/0, 1 moulded Han-Compact® hood		
	2.5 - 4 mm²	09 12 008 4801
	4 - 6 mm²	09 12 008 4811

Han-Power® S

FEATURES

- 6 IDCs + PE
- Wire gauge 2.5 - 6 mm²
- No interruption of the energy supply
- Leading protective ground within the insert
- 2 plug-in cable entries

Identification		Part number
Han-Power® S Han® Q 8/0, 2 screwed Han-Compact® housing, bulkhead mounting	2.5 - 4 mm²	09 12 008 4802

System cables in fixed lengths

FEATURES

- standard lengths available with short lead times
- 100 % tested to ensure fault-free installation
- Cable: 7 x 2.5 mm²

Identification		Part number
Cable lengths (total length)	1.5 m	20 88 841 0015
	3 m	20 88 841 0030
	5 m	20 88 841 0050
	10 m	20 88 841 0100
	15 m	20 88 841 0150
	30 m	20 88 841 0300

Han® Q 8/0

FEATURES

- Robust metal housing
- 8 contact chambers for crimp contacts of Han E® series plus PE
- Space-saving and compact design
- Leading protective ground
- current rating 16 A

Identification	Part number	
	Male insert (M)	Female insert (F)
Contact insert with Han-Quick Lock®[1)]	09 12 008 2633	09 12 008 2733
Crimp termination Order crimp contacts separately	09 12 008 3001	09 12 008 3101
Han® E Crimp contacts		
Power contacts silver plated 1.5 mm²	09 33 000 6104	09 33 000 6204
Power contacts silver plated 2.5 mm²	09 33 000 6102	09 33 000 6202
Power contacts silver plated 4 mm²	09 33 000 6107	09 33 000 6207

Identification	Part number	Cable entry metric
Hoods, metal side-entry Order cable clamp separately	black chromated 19 12 708 0501	M25
Hoods, metal top entry Order cable clamp separately	19 12 008 0426	M25
Cable seal, metal	19 12 000 5058	M25

Han-Power® S with cable entry

FEATURES

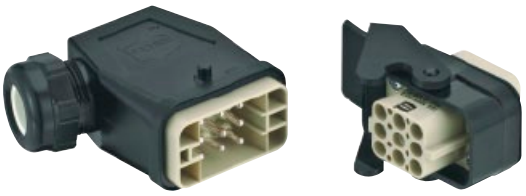
- 6 IDCs + PE
- Wire gauge 2.5 - 4 mm²
- No interruption of the energy supply
- Assembly with standard tools
- customer-specific T connection with defined cable length and connector available on request

Identification	Part number
Han-Power® S with cable clamp with 1 permanently attached cable 3 m, 7 x 2.5 mm²	09 12 008 4803

Han® Q 8/0

FEATURES

- Thermoplastic housing
- 8 contact chambers for crimp contacts of Han E® series plus PE
- Space-saving and compact design
- Leading protective ground
- current rating 16 A



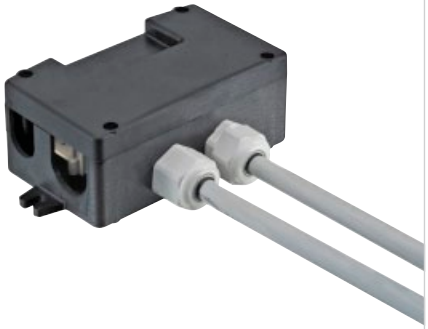
Identification	Part number	
	Male insert (M)	Female insert (F)
Contact insert with Han-Quick Lock®[1)]	09 12 008 2633	09 12 008 2733
Crimp termination Order crimp contacts separately	09 12 008 3001	09 12 008 3101
Han® E Crimp contacts		
Power contacts silver plated 1.5 mm²	09 33 000 6104	09 33 000 6204
2.5 mm²	09 33 000 6102	09 33 000 6202
4 mm²	09 33 000 6107	09 33 000 6207

Identification	Part number	Cable entry
Hoods, thermoplastic side-entry Order cable clamp separately	09 12 008 0527	Pg 16
Hoods, thermoplastic top entry Order cable clamp separately	19 12 008 0429	M25
Cable seal, thermoplastic	19 12 000 5157	M25
Cable seal, thermoplastic	09 00 000 5059	Pg 16

Han-Power® S with 2 cable entries

FEATURES

- 6 IDCs + PE
- Wire gauge 4 - 6 mm²
- No interruption of the energy supply
- Assembly with standard tools
- customer-specific T connection with defined cable length and connector available on request



Identification	Part number
Han-Power® S with cable clamp with 2 permanently attached cables, 4 x 2.5 mm²	09 12 008 4817

For more information, refer to chapter 15 of the HARTING Han® industrial connector catalogue or go to www.HARKIS.HARTING.com

[1)] For more information, refer to Chapter 00 of the HARTING Han® industrial connector catalogue

Han® Q 5/0

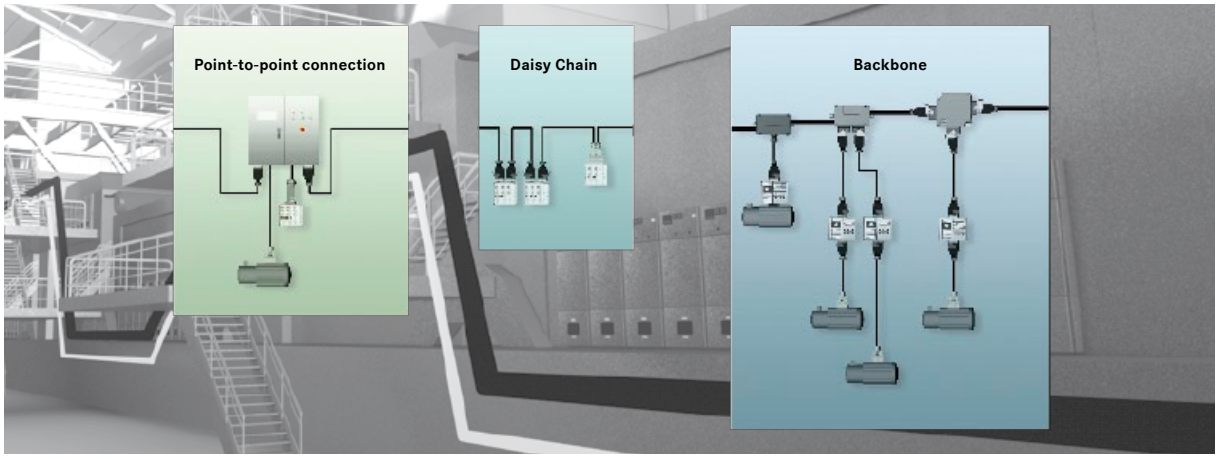
The HARTING Han® Q 5/0 product family offers a fully pluggable solution for distributed power applications, for example to support modular system design. Pre-terminated system cables and connectors with crimp terminals or Han-Quick Lock®[1] termination support a variety of installation solutions.

Technical characteristics

Contact inserts	
Number of contacts	5 + PE
Electrical data	
acc. to DIN EN 61 984	16 A 230/400 V 4 kV 3
Rated current	16 A
Rated voltage conductor - ground	230 V
Rated voltage conductor - conductor	400 V
Rated impulse voltage	4 kV
Pollution degree	3
Pollution degree 2 also	16 A 320/500 V 4 kV 2
Rated voltage acc. to UL/CSA	600 V
Material	Polycarbonate
Limiting temperatures	-40 °C ... 125 °C
Mechanical working life	
- Mating cycles	≥ 500

Contacts	
Material	copper alloy
Surface, hard silver plated	3 µm Ag
Crimp termination	
- mm^2	0.14 ... 2.5 mm^2
- AWG	26 ... 14
PE as screw termination	
- mm^2	up to 2.5 mm^2
- AWG	14
Hoods/housings	
Plastic hoods/housings	
Material	Polycarbonate
Degree of protection acc. to DIN EN 60 529 for coupled connector	IP 67

Installation solutions



Applications

Systems & machine applications

USER BENEFITS:

- compact design
- fast-connect QuickLock[1] technology for field installation
- rated at 400 V
- for modular system design

Han-Power® T

FEATURES

- Per 1 connection for power input, power output and to device
- 4 Power contacts
- Plastic housings are integrated in the moulding
- Compact design

Identification	Part number
Han-Power® T with 3 x Han® Q 5/0	09 12 008 4751

Han® Q 5/0 connector

FEATURES

- Innovative Han-Quick Lock®[1] termination technology with up to 20% reduction in assembly time
- Field-assembly without special tools
- 5 contact chambers for crimp contacts of Han E® series
- Leading protective ground

Identification	Part number	
	Male insert (M)	Female insert (F)
Contact insert with Han-Quick Lock®[1] termination	09 12 005 2633	09 12 005 2733
Crimp termination	09 12 005 3001	09 12 005 3101
Han® E Crimp contacts silver plated 1 mm²	09 33 000 6105	09 33 000 6205
1.5 mm²	09 33 000 6104	09 33 000 6204
2.5 mm²	09 33 000 6102	09 33 000 6202

Identification	Part number	Cable entry metric
Hood thermoplastic top entry	black 19 20 003 0427	1 x M20
Housing, bulkhead mounting	black 09 20 003 0327	
Cable seal (IP 68) thermoplastic	19 00 000 5184	M20

For more information, refer to chapter 15, 31 and 40 of the HARTING Han® industrial connector catalogue or go to www.HARKIS.HARTING.com

[1] For more information, refer to Chapter 00 of the HARTING Han® industrial connector catalogue

Han® Q 2/0

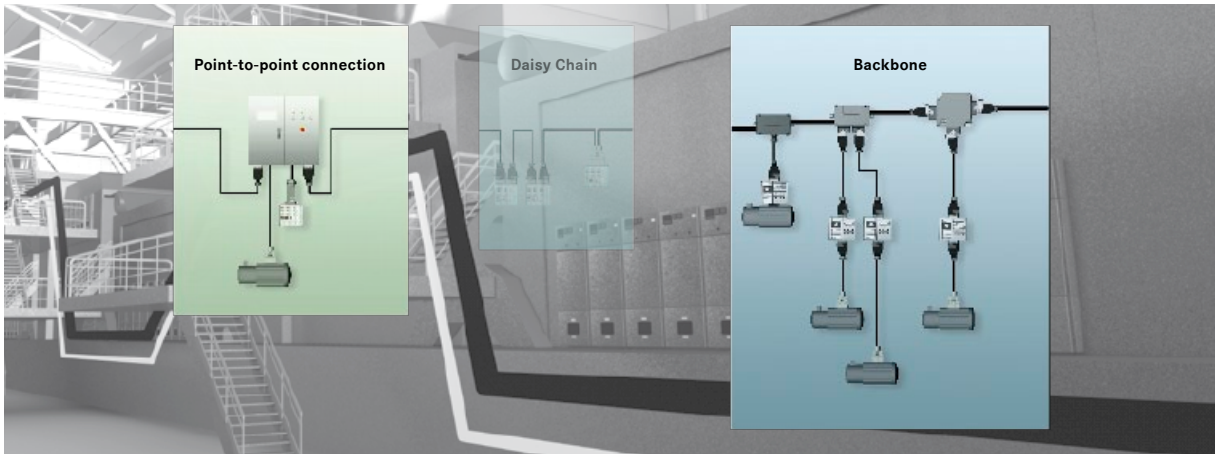
The Han® Q 2/0 product family is ideal for single-phase power distribution or 24 V networks, especially on applications with large cable cross sections. The Han® Q 2/0 connector is available with axial screw termination[1)] for field assembly.

Technical characteristics

Contact inserts	
Number of contacts	2 + PE
Electrical data	
acc. to DIN EN 61 984	40 A 400 V 6 kV 3
Rated current	40 A
Rated voltage	400 V
Rated impulse voltage	6 kV
Pollution degree	3
Rated voltage acc. to UL/CSA	600 V
Material	Polycarbonate
Limiting temperatures	-40 °C ... 125 °C
Flammability acc. to UL 94	V 0
Mechanical working life	
- Mating cycles	≥ 500

Contacts	
Material	copper alloy
Surface, hard silver plated	3 µm Ag
Axial screw termination	
- mm^2	4 ... 6 mm^2 (10 mm^2 optional)
- AWG	12 ... 10 (8 optional)
Torque	1.8 Nm
Stripping length	8 mm^{+1}
Hoods/housings	
Plastic hoods/housings	
Material	Polycarbonate
Degree of protection acc. to DIN EN 60 529 for coupled connector	IP 67

Installation solutions



Applications

Systems & machine applications

USER BENEFITS:

- compact design
- high current rating (40 A)
- axial screw temination[1)]
- no special tools

Han-Power® T Q 2/0

FEATURES

- Per 1 connection for power input, power output and to device
- 2 Power contacts
- Plastic housings are integrated in the moulding
- Compact design

Identification	Part number
Han-Power® T with 3 x Han® Q 2/0	09 12 008 4752

Han® Q 2/0 connector

FEATURES

- Compact design with axial screw termination[1)]
- 16 coding possibilities
- suitable for hoods and housings of Han® 3 A series
- Touch-proof of male and female contacts

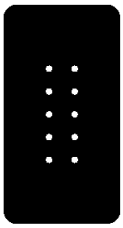
Identification	Part number	
	Male insert (M)	Female insert (F)
Contact insert with Axial screw termination[1)] 400 V / 40 A	09 12 002 2651	09 12 002 2751

Identification	Part number	Cable entry metric
Hood, thermoplastic top entry	black 19 20 003 0427	1 x M20
Hood, metal top entry	19 20 003 1440	1 x M20
Housing, bulkhead mounting	09 20 003 0301	
Cable seal (IP 68) thermoplastic	19 00 000 5184	M20

For more information, refer to chapter 15, 31 and 40 of the HARTING Han® industrial connector catalogue or go to www.HARKIS.HARTING.com

[1)] For more information, refer to Chapter 00 of the HARTING Han® industrial connector catalogue

Han E®



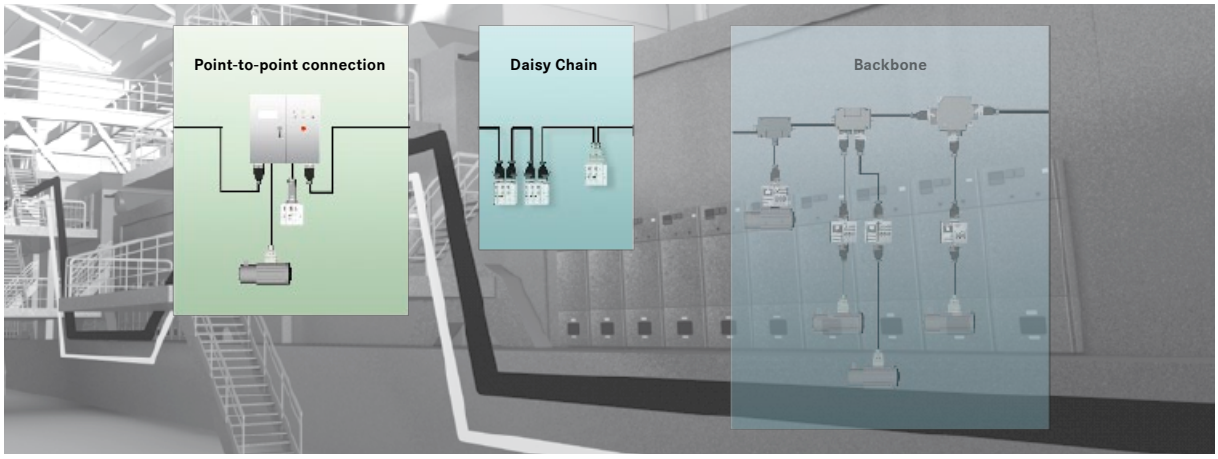
The HARTING Han E® product family and the Han® 10 E contact insert are an ISO 23 570-compliant solution for distributing power to motors and for daisy-chain power distribution.

Technical characteristics

Contact inserts	
Number of contacts	6, 10, 16, 24, 32 (2x 16), 48 (2x 24) + PE
Electrical data acc. to DIN EN 61 984	16 A 500 V 6 kV 3
Rated current	16 A
Rated voltage	500 V
Rated impulse voltage	6 kV
Pollution degree	3
Pollution degree 2 also	16 A 400/690 V 6 kV 2
Rated voltage acc. to UL/CSA	600 V
Insulation resistance	≥ 10^{10} Ω
Material	Polycarbonate
Limiting temperatures	-40 °C ... +125 °C

Flammability acc. to UL 94	V 0
Mechanical working life - Mating cycles	≥ 500
Hoods/housings	
Material	aluminium die-cast
Surface	powder-coated
Locking element	Han-Easy Lock®
Flammability acc. to UL 94	V 0
Hoods/housingsdichtung	NBR
Limiting temperatures	-40 °C ... +125 °C
Degree of protection acc. to DIN EN 60 529 for coupled connector	IP 65

Installation solutions



Applications

Systems & machine applications

USER BENEFITS:

- compact design
- daisy chain wiring in a connector with a Han® ESS insert
- ISO 23 570-compliant Han® 10 E connector as the interface to the motor

Han® 10 E

FEATURES
- reliable cage clamp connection
- no special tools needed
- vibration tested
- 2 connection options per contact
- ideal for star delta circuits

Identification	Part number	Baureihe
Contact insert with crimp termination	09 33 010 2702	Han E®
Identification	**Part number**	**Wire gauge (mm^2)**
Han® E Crimp contact Power contact	09 33 000 6202	2.5
Identification	**Part number**	**Cable entry metric**
Hoods Han® B serie 10 B top entry	19 30 010 1440 19 30 010 1441	1 x M20 1 x M20
Cable clamps for M thread		
Cable seal (IP 68) metal	19 00 000 5092	M20

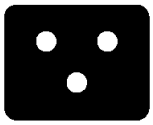
Han® 10 ESS

FEATURES
- reliable cage clamp connection
- no special tools needed
- vibration tested
- 2 connection options per contact
- ideal for star delta circuits

Identification	Part number	Baureihe
Contact insert with Cage-clamp terminal 2 terminations per contact	09 33 010 2772	Han® ESS
Identification	**Part number**	**Cable entry metric**
Hoods Han® B serie 10 B top entry	19 30 010 0465	2 x M20
Cable clamps for M thread		
Cable seal (IP 68) metal	19 00 000 5084	M20

For more information, refer to chapter 03, 31 and 40 of the HARTING Han® industrial connector catalogue or go to www.HARKIS.HARTING.com

HARTING PushPull Power 2/0



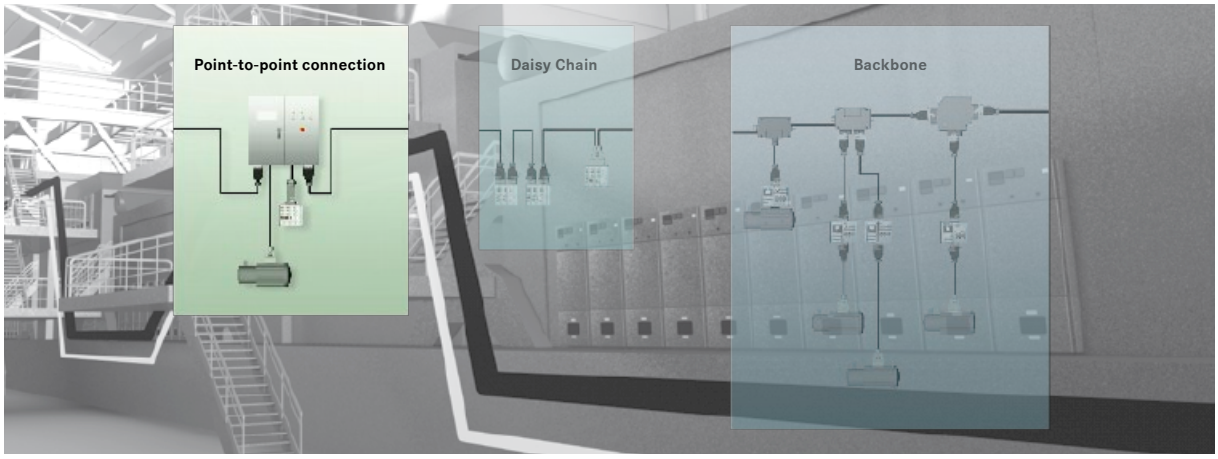
The HARTING PushPull Power 2/0 is a family of device connectors for applications such as power distribution to LED panels. Because they have a small footprint and can be mounted side-by-side, these connectors save a lot of space.

Technical characteristics

Locking	PushPull technology acc. to IEC 61 076-3-106 variant 4
Degree of protection	IP 65 / IP 67
Number of contacts	2 + PE
Electrical data acc. to EN 61 984	16 A 250 V 4 kV 3
Cable diameter	4.9 ... 8.6 mm

Termination	Crimp
Termination cross section	0.75 - 2.5 mm² (AWG 20 - 12) stranded
Mating cycles	min. 750
Temperature range	-40 °C up to +70 °C
Housing material	thermoplastic, black
Flammability acc. to UL 94	V 0

Installation solutions



Applications

Machine applications

USER BENEFITS:

- compact design
- PushPull locking increases packing density
- one-handed operation
- for AC voltage up to 250 V
- very extensive product family

HARTING PushPull Power 2/0 connector

FEATURES

- Power connectors for devices
- Compact, space-saving design
- Touch-proof acc. to IEC DIN EN 60 529
- Polarisation with nose
- Cable side: male with crimp termination
- 4 different coding variants without loss of contact

Identification	Part number
Connector set incl. 3 turned crimp contacts (male), insulation (black), housing, cable gland	09 46 145 3410

HARTING PushPull Power 2/0 panel feed-through

FEATURES

- Power connectors for devices
- Compact, space-saving design
- Touch-proof acc. to IEC DIN EN 60 529
- Polarisation with nose
- Device side: female with crimp termination
- EasyInstall panel feed-through for simple device integration
- 4 different coding variants without loss of contact

Identification	Part number
Housings, bulkhead mounting incl. 3 turned female contacts, insulation (black)	
Compact	09 46 245 3410
EasyInstall	09 46 245 3430

For more information, refer to chapter 02 of the HARTING Device Connectivity catalogue or go to www.HARKIS.HARTING.com

HARAX® M12

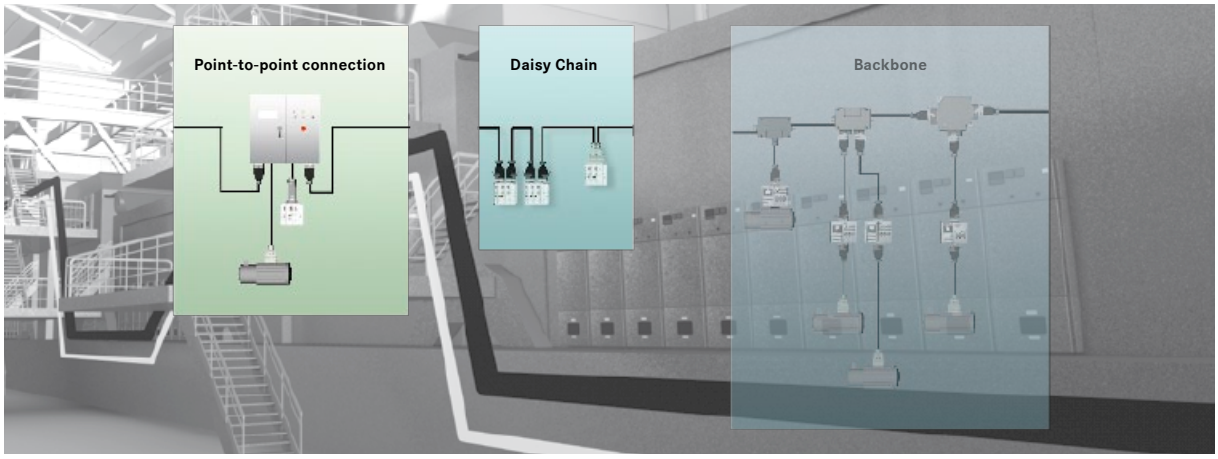
HARAX® is a field-installable M12 connection solution which is primarily designed for sensor and actuator applications. Pre-terminated system cables offering a choice of lengths and cable outlet angles are also available for these applications.

Technical characteristics

Construction type	*HARAX*® M12-L
Rated voltage	50 V
Rated current	4 A
Wire gauge	0.34 - 0.5 mm²
	AWG 22 - 20
Diameter of individual strands	≥ 0.1 mm
Conductor insulation material	PVC
Conductor diameter	2.0 - 2.3 mm
Cable diameter	3 poles: 5.5 - 7.2 mm
	4 poles: 6 - 8 mm

Limiting temperatures	- 40 °C / + 85 °C
Temperature during connection	- 5 °C ... + 50 °C
Degree of protection	IP 67
Termination cycles with the same cross section	10
Recommended tightening torque / Hexagonal wrench	0.5 Nm / SW 17

Installation solutions



Applications

Systems & machine applications

USER BENEFITS:

- broad portfolio of straight and angled round connectors, PCB adapters, all products A-coded
- round connectors featuring *HARAX*® quick-connect
- field installation
- customer-specific and standard system cables
- 3, 4 and 5 contact versions
- UL approval

HARAX® M12 circular connector

FEATURES

- Rapid termination with *HARAX*®
- for shielded and unshielded cables
- can be assembled in the field
- simply strip back the insulation, insert the wires, screw the connector together and you have a gas-tight, vibration-proof connection

Identification	Part number	
	male	female
HARAX® M12-L		
3 poles, A-coded, with pre-leading contact	21 03 212 1400	21 03 212 2400
3 poles, A-coded	21 03 212 1306	21 03 212 2306
4 poles, A-coded	21 03 212 1305	21 03 212 2305

Han® M12 panel feed-through

FEATURES

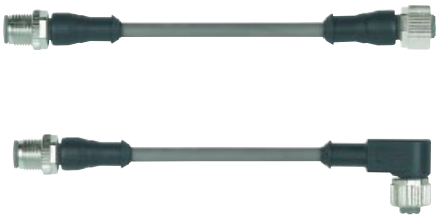
- panel feed-throughs with various connection systems
  - Conductor
  - *HARAX*® Rapid termination
  - Crimp termination

Identification	Part number	
	male	female
A-coded, 50 cm conductors, 0.5 mm², 5 poles	21 03 311 1501	21 03 311 2501

Pre-assembled system cables

FEATURES

- extensive range of pre-terminated M12 system cables
- HARTING also supplies customer-specific pre-terminated cables, which can be provided as overmolded versions.



Identification		Part number
Han® M12 circular connector		
female straight, male straight		
Length:	0.3 m	21 03 415 2401
	0.6 m	21 03 415 2402
	1.0 m	21 03 415 2403
	1.5 m	21 03 415 2404
	2.0 m	21 03 415 2405

For more information, refer to chapter 03 of the HARTING Device Connectivity catalogue or go to www.HARKIS.HARTING.com

HARAX® 7/8"

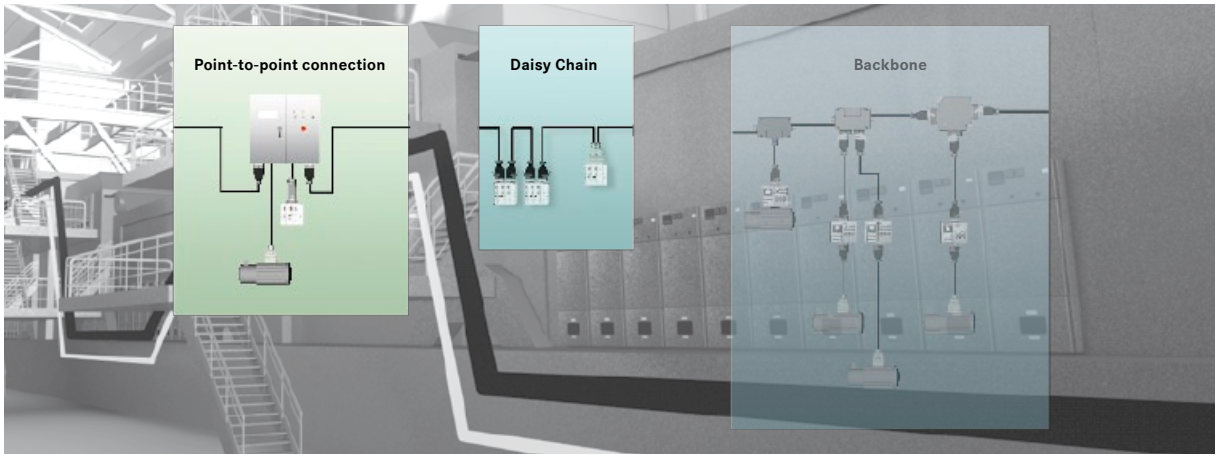
HARAX® is a field-assembled 7/8" connector solution designed primarily for distributed DeviceNet and 24 V systems. Pre-terminated system cables in varying lengths are also available for these applications.

Technical characteristics

Construction type	*HARAX*® 7/8"
Rated voltage	230 V / 400 V
Rated current	10 A
Wire gauge	0.75 - 1.5 mm²
	AWG 18 - 16
Diameter of individual strands	≥ 0.15 mm
Conductor insulation material	PVC, PP, TPE
Conductor diameter	≤ 2.8 mm
Cable diameter	6.8 - 9.5 mm (black)
	9 - 12.5 mm (grey)
Limiting temperatures	- 40 °C / + 85 °C
Temperature during connection	- 5 °C ... + 50 °C
Degree of protection	IP 65 / IP 67
Termination cycles with the same cross section	10

Degree of protection	IP 67
Temperature range	
applies to moved cable	-20 °C ... +80 °C
cables permanently installed	-50 °C ... +80 °C
Rated current	max. 8 A each contact (+40 °C)
Rated voltage	230 / 400 V
Cable data	
Jacket material	PUR
Jacket colour	grey
Wire isolation	TPM
Wire gauge	5 x 1.5 mm²
Standards	UL / CSA

Installation solutions



Applications

Systems & machine applications

USER BENEFITS:

- 7/8" featuring *HARAX*® quick-connect
- field assembly, no special tools needed
- IP 65 / IP 67 protection
- high current rating (10 A)
- UL approval

HARAX® 7/8" circular connector

FEATURES

- Rapid termination with *HARAX*®
- assembly on site
- simply strip back the insulation, insert the wires, screw the connector together and you have a gas-tight, vibration-proof connection.

Identification	Part number	
	male	female
HARAX® 7/8"	21 04 116 1505	21 04 116 2505

Han® 7/8" panel feed-through

FEATURES

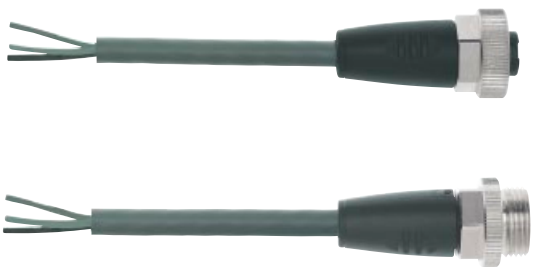
- front bulkhead mounted
- version in male und female

Identification	Part number	
	male	female
30 cm conductors, 0.75 mm², 5 poles	21 04 316 1505	21 04 316 2505

Pre-assembled system cables

FEATURES

- extensive range of pre-terminated 7/8" system cables
- straight and angled
- HARTING also supplies customer-specific pre-terminated cables, which can be provided as overmolded versions.



Identification		Part number
Overmolded cordsets 7/8"		
female straight, 5 poles		
Length:	1.5 m	21 04 516 2501
	3.0 m	21 04 516 2502
	5.0 m	21 04 516 2503
	7.5 m	21 04 516 2504
	10.0 m	21 04 516 2505

For more information, refer to chapter 03 of the HARTING Device Connectivity catalogue or go to www.HARKIS.HARTING.com

HARTING PushPull Power 4/0

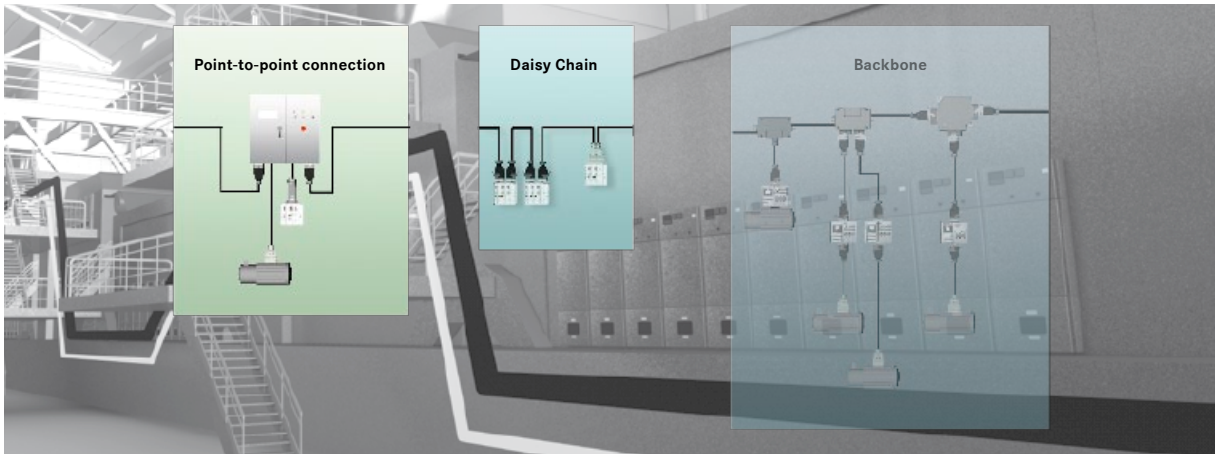
The HARTING PushPull Power 4/0 is a family of compact device connectors for applications such as redundant low-voltage power supply. Because they have a small footprint and can be mounted side-by-side, the connectors save a lot of space.

Technical characteristics

Locking	PushPull technology acc. to IEC 61 076-3-106 variant 4
Degree of protection	IP 65 / IP 67
Number of contacts	4
Electrical data acc. to EN 61 984	12 A 48 V 1.5 kV 3
Cable diameter	4.9 ... 8.6 mm
Termination	Crimp
Termination cross section	0.75 - 2.5 mm² (AWG 20 - 12) stranded

Termination	Solder pins
Termination diameter	1.6 mm
Termination	Cable cage
Termination cross section	0.75 - 2.5 mm² (AWG 20 - 12) stranded
Mating cycles	min. 750
Temperature range	-40 °C up to +70 °C
Housing material	thermoplastic, black
Flammability acc. to UL 94	V 0

Installation solutions



Applications

Machine applications

USER BENEFITS:

- compact design
- PushPull locking increases packing density
- one-handed operation
- for DC voltage up to 48 V

HARTING PushPull Power 4/0

FEATURES

- available as plastic or metal housing
- Compact, space-saving design
- Touch-proof acc. to IEC DIN EN 60 529
- Polarisation with nose
- Cable side: male with crimp termination
- Device side: female with cable cage, crimp or solder termination
- 4 different coding variants without loss of contact

Identification	Part number
Connector set	
incl. 4 turned crimp contacts (male), for 1.5 mm² conductor cross-section, insulation, housing, cable gland	
thermoplastic	09 46 145 4400
metal	09 46 195 4400
Components device side	
Housings, bulkhead mounting	
complete set with contacts, insulation and housing, bulkhead mounting	
with crimp termination for 1.5 mm²	
EasyInstall thermoplastic (see photo)	09 46 245 4430
EasyInstall metal	09 46 295 4430
Compact thermoplastic	09 46 245 4400
with solder termination, angled	
EasyInstall thermoplastic	09 46 245 4030
EasyInstall metal (see photo)	09 46 295 4030
Compact thermoplastic	09 46 245 4000
with cage clamp terminal on pcb	
EasyInstall thermoplastic	09 46 245 4031
EasyInstall metal	09 46 295 4031
Compact thermoplastic (see photo)	09 46 245 4001
Female insert for PCB termination 48 V / 12 A, angled	09 46 500 4400

For more information, refer to chapter 02 of the HARTING Device Connectivity catalogue or go to www.HARKIS.HARTING.com

Han® PushPull L Power 4/0

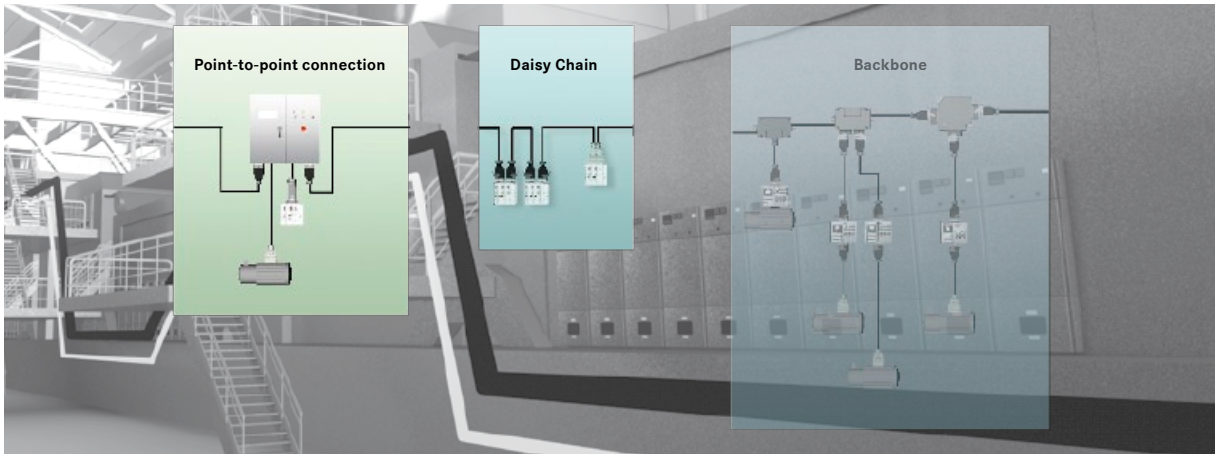
The HARTING Han® PushPull L Power product family features AIDA-compliant connectors for standardized 24 V power distribution in the automotive industry.

Technical characteristics

Locking	PushPull technology acc. to IEC/PAS 61 076-3-117
Degree of protection	IP 65 / IP 67
Number of contacts	4 + PE
Electrical data acc. to DIN EN 61 984	16 A 24 V 4 kV 3
Termination	spring force connection
Termination cross section	0.75 ... 2.5 mm²

Mating cycles	min. 500
Temperature range	-40 °C ... +70 °C
Cable diameter	9 - 13 mm
Housing material	thermoplastic, black
Flammability acc. to UL 94	V 0
Housing material	Zinc die-cast, nickel plated

Installation solutions



Applications

Systems & machine applications

USER BENEFITS:

- AIDA-compliant
- one-hand operation
- spring clip design for field installation
- 24 V DC connector for Profinet devices

Han® PushPull L Power 4/0

FEATURES

- available as plastic or metal housing
- Cable side: female
  - spring force connection
- Device side: male
  - Panel feed-through with spring force connection
  - Male insert for PCB termination
- AIDA-conform

Identification	Part number
Connector, thermoplastic	
including housing and female insert, 16 A, 24 V 9 - 13 mm clamp range with spring force connection	09 35 431 0421
Connector, metal	
including housing and female insert, 16 A, 24 V 9 - 13 mm clamp range with spring force connection	09 35 431 0401
Panel feed-through, thermoplastic	
incl. housing, bulkhead mounting, and male insert, 16 A, 24 V, with spring force connection (see photo)	09 35 431 0331
Panel feed-through, metal	
incl. housing, bulkhead mounting, and male insert, 16 A, 24 V with spring force connection	09 35 431 0311
Components device side	
Housing, bulkhead mounting, thermoplastic	09 35 004 0321
Housing, bulkhead mounting, metal (see photo)	09 35 004 0301
Male insert for PCB termination 16 A, 24 V	
angled	09 35 004 3003
straight	09 35 004 3004

For more information, refer to chapter 02 of the HARTING Device Connectivity catalogue or go to www.HARKIS.HARTING.com

HARTING
Subsidiary companies – worldwide

Austria
HARTING Ges. m. b. H.
Deutschstraße 19, A-1230 Wien
Phone +431/6162121, Fax +431/6162121-21
E-Mail: at@HARTING.com

Belgium
HARTING N.V./S.A.
Z.3 Doornveld 23, B-1731 Zellik
Phone +322/4660190, Fax +322/4667855
E-Mail: be@HARTING.com

Brazil
HARTING Ltda.
Av. Dr. Lino de Moraes, Pq. Jabaquara, 255
CEP 04360-001 - São Paulo - SP - Brazil
Phone +5511/5035-0073, Fax +5511/5034-4743
E-Mail: br@HARTING.com
Internet: www.HARTING.com.br

China
Zhuhai HARTING Limited, Shanghai Branch
Room 5403, 300 Huaihai Zhong Road
Hong Kong New World Tower, Luwan District, P.R.C
Shanghai 200021, China
Phone +86 21 - 63 86 22 00
Fax +86 21 - 63 86 86 36
E-Mail: cn@HARTING.com
Internet: www.HARTING.com.cn

Czech Republic
HARTING spol. s.r.o.,
Mlýnská 2, 16000 Praha 6
Phone +420 220 380 460, Fax +420 220 380 461
E-Mail: cz@HARTING.com
Internet: www.HARTING.cz

Finland
HARTING Oy
Teknobulevardi 3-5, PL 35, FI-01530 Vantaa
Phone +358 9 350 873 00, Fax +358 9 350 873 20
E-Mail: fi@HARTING.com

France
HARTING France
181 avenue des Nations, Paris Nord 2
BP 66058 Tremblay en France
F-95972 Roissy Charles de Gaulle Cédex
Phone +33149383400, Fax +33148632306
E-Mail: fr@HARTING.com

Germany
HARTING Deutschland GmbH & Co. KG
Postfach 2451 · D-32381 Minden
Simeonscarré 1 · D-32427 Minden
Phone +49 571 8896-0, Fax +49 571 8896-282
E-Mail: de@HARTING.com
Internet: www.HARTING.com

Office Germany
HARTING Deutschland GmbH & Co. KG
Blankenauer Straße 99, D-09113 Chemnitz
Phone +49 0371 429211, Fax +49 0371 429222
E-Mail: de@HARTING.com

Great Britain
HARTING Ltd.
Caswell Road, Brackmills Industrial Estate
GB-Northampton, NN4 7PW
Phone +441604/766686, 827500
Fax +441604/706777
E-Mail: gb@HARTING.com
Internet: www.HARTING.co.uk

Hong Kong
HARTING (HK) Limited,
Regional Office Asia Pacific
3512 Metroplaza Tower 1, 223 Hing Fong Road
Kwai Fong, N. T., Hong Kong
Phone +852/2423-7338, Fax +852/2480-4378
E-Mail: ap@HARTING.com
Internet: www.HARTING.com.hk

Hungary
HARTING Magyarországi Kft.
1119 Budapest, Fehérvári út 89-95, II. emelet 217/A.
Phone +36-1-205 3464, Fax +36-1-205 3465
E-Mail: hu@HARTING.com
Internet: www.HARTING.hu

India
HARTING India Private Limited
No. D, 4th Floor, ‚Doshi Towers'
No. 156 Poonamallee High Road,
Kilpauk, Chennai 600 010, Tamil Nadu, Chennai
Phone +91-44-4356 0415/6, Fax +91-44-4356 0417
E-Mail: in@HARTING.com
Internet: www.HARTING.com

Italy
HARTING SpA
Via Dell' Industria 7, I-20090 Vimodrone (Milano)
Phone +3902/250801, Fax +3902/2650597
E-Mail: it@HARTING.com

Japan
HARTING K. K.
Yusen Shin-Yokohama 1 Chome Bldg., 2F
1-7-9, Shin-Yokohama, Kohoku-ku, Yokohama
222-0033 Japan
Phone +81 45 476 3456, Fax: +81 45 476 3466
E-Mail: jp@HARTING.com
Internet: www.HARTING.co.jp

Korea
HARTING Korea Limited
#308 Leaders Bldg., 342-1, Yatap-dong, Bundang-gu
Sungnam-City, Kyunggi-do, 463-828, Korea
Phone +82-31-781-4615, Fax +82-31-781-4616
E-Mail: kr@HARTING.com

Netherlands
HARTING B.V.
Larenweg 44, NL-5234 KA ‚s-Hertogenbosch
Postbus 3526, NL-5203 DM ‚s-Hertogenbosch
Phone +3173/6410404, Fax +3173/6440699
E-Mail: nl@HARTING.com

Norway
HARTING A/S,
Østensjøveien 36, N-0667 Oslo
Phone +4722/700555, Fax +4722/700570
E-Mail: no@HARTING.com

Poland
HARTING Polska Sp. z o. o.
ul. Kamieńskiego 201-219, 51-126 Wrocław
Phone +48 71-352 81 71, Phone +48 71-352 81 74
Fax +48 71-320 74 44
E-Mail: pl@HARTING.com
Internet : www.HARTING.pl

Portugal
HARTING Iberia, S. A.
Avda. Josep Tarradellas, 20-30, 4º 6ª,
08029 Barcelona (Spain)
Phone +351.219.673.177, Fax +351.219.678.457
E-Mail: es@HARTING.com

Russia
HARTING ZAO
ul. Tobolskaja 12, Saint Petersburg, 194044 Russia
Phone +7/812/3276477, Fax +7/812/3276478
E-Mail: ru@HARTING.com, Internet: www.HARTING.ru

Singapore
HARTING Singapore Pte Ltd.
No. 1 Coleman Street, #B1-21 The Adelphi
Singapore 179803
Phone +6562255285, Fax +6562259947
E-Mail: sg@HARTING.com

Spain
HARTING Iberia S.A.
Avda. Josep Tarradellas 20-30 4º 6ª, 08029 Barcelona
Phone +34 933 638 475, Fax +34 933 638 585
E-Mail: es@HARTING.com

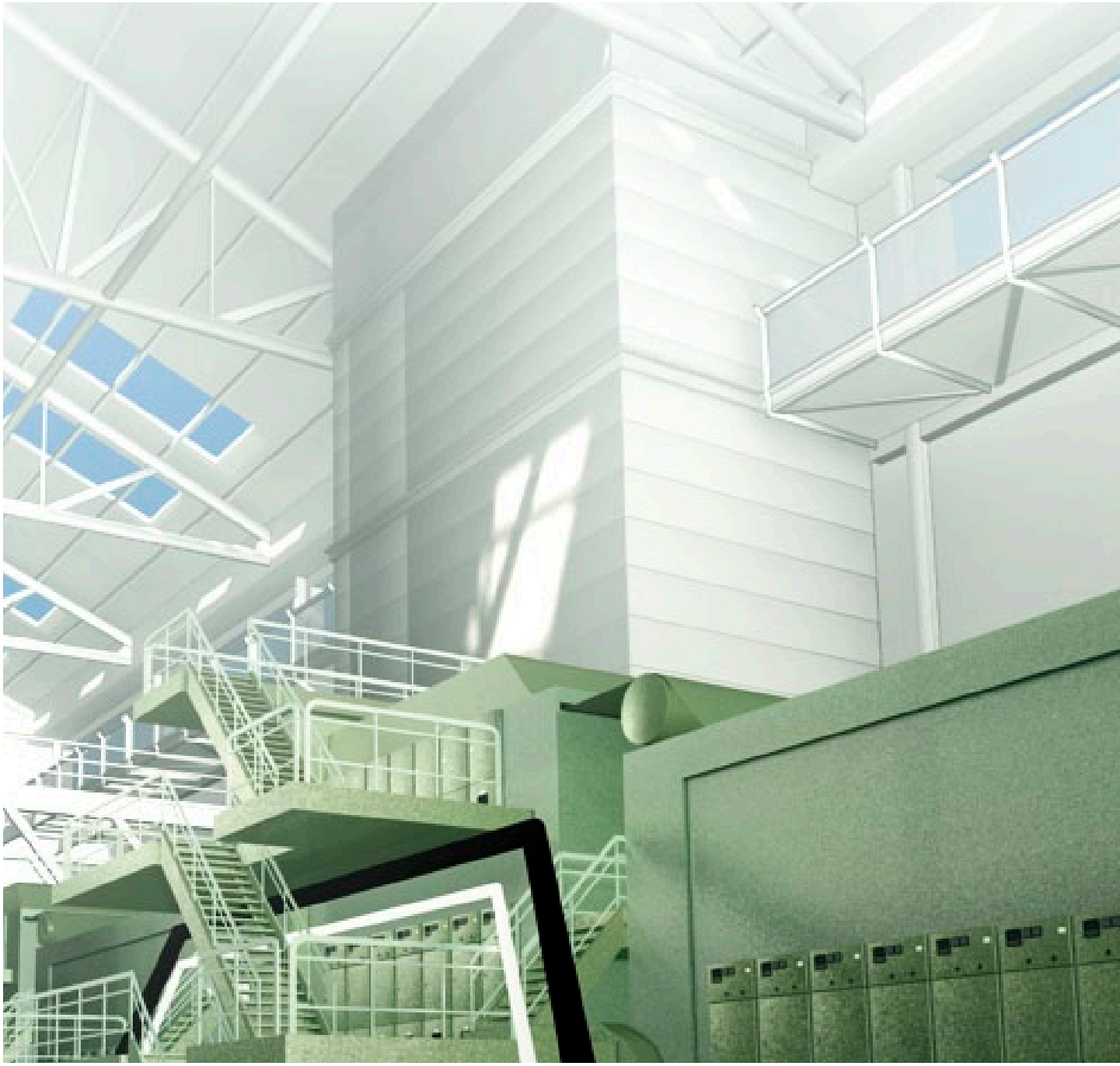
Sweden
HARTING AB
Gustavslundsvägen 141 B 4tr, 167 51 Bromma
Phone +468/4457171, Fax +468/4457170
E-Mail: se@HARTING.com

Switzerland
HARTING AG
Industriestrasse 26, CH-8604 Volketswil
Phone +41 44 908 20 60, Fax +41 44 908 20 69
E-Mail: ch@HARTING.com

Taiwan
HARTING R.O.C. Limited
Room 1, 5th Floor, No. 495 Guang Fu South Road
110 Taipei, Taiwan
Phone +886 02-2758-6177, Fax +886 02-2758-7177
E-Mail: tw@HARTING.com
Internet: www.HARTING.com.tw

USA
HARTING Inc. of North America
1370 Bowes Road, Elgin, Illinois 60123
Phone +1 (877) 741-1500 (toll free)
Fax +1 (866) 278-0307 (Inside Sales)
Fax +1 (847) 717-9430 (Sales and Marketing)
E-Mail: us@HARTING.com
Internet: www.HARTING-USA.com

Eastern-Europe
HARTING Eastern Europe GmbH
Bamberger Straße 7, D-01187 Dresden
Phone +49 351 / 4361760, Fax +49 351 / 4361770
E-Mail: Eastern.Europe@HARTING.com



HARTING Pushing Performance

HARTING Electric GmbH & Co. KG
P.O. Box 1473 | D-32328 Espelkamp
Phone +49 5772 47-97100 | Fax + 49 5772 47-495
electric@HARTING.com | www.HARTING.com

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